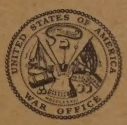
TM 11-1228

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

RANGE CALIBRATOR TS/573/UP



DEPARTMENT OF THE ARMY • *JULY 1956*

TABLE OF CONTENTS

Paragraph	Title	Page
	SECTION 1—GENERAL DESCRIPTION	
1.	Purpose and Principles of Operation	1-1
2.	Description	1-1
3.	Reference Data	1-2
a.	General	1-2
b.	Electrical Characteristics	1-3
c.	Equipment Lists	1-3
	SECTION 2—THEORY OF OPERATION	
1.	General	2-0
a.	Purpose of Equipment	2-0
b.	Principles of Operation	2-0
c.	Binary Counters	2-2
d.	Mechanical Arrangement	2-3
2.	Range Counting Fundamentals	2-3
a.	Basic Information	2-3
b.	Adjustable Counting Circuit	2-3
(1)	General	2-3
(2)	Decade Counters	2-5
(3)	Counter Operation	2-5
c.	Coincidence and Resetting	2-6
(1)	Mixer-Coincidence Circuit	2-6
(2)	Resetting Circuit	2-9
d.	Summary	2-9
3.	Female Board E101	2-9
a.	Triggering Circuits	2-9
b.	Blocking Oscillator Output Circuit	2-10
4.	Female Board E201	2-11
a.	Crystal Oscillator	2-11
b.	Gated Amplifier	2-11
c.	Gate Multivibrator	2-11
d.	Summary	2-11
.5	Female Board E301	2-11
a.	Function	2-11
b.	High-Speed Counter Circuit	2-11
6.	Female Boards E401, E501, E601	2-12A
a.	General	2-12A
b.	Counting Operation	2-12A
c.	Resetting	2-13
d.	Coincidence Outputs	2-13
7.	Female Board E701	2-13
a.	Low-Speed Counter Circuit	2-13
b.	Reset Circuit	2-14
8.	Female Board E801	2-14
a.	Mixer-Coincidence Circuit	2-14
b.	Comparator Mixer Stage	2-15
9.	Female Board E901	2-15
a.	Dither Circuit	2-15
b.	Comparator Multivibrator	2-15
c.	Summary	2-16
10.	Power Supply and Miscellaneous Circuits	2-16
a.	Power Supply Circuit	2-16
b.	Blower Assembly	2-16
	SECTION 3—INSTALLATION	
1.	Unpacking	3-1
a.	General	3-1
b.	Unpacking Procedure	3-1
2.	Installation	3-1
3.	Initial Adjustments	3-1
a.	General	3-1
b.	Procedure	3-1
	SECTION 4—OPERATION	
1.	General	4-1
2.	Capabilities and Limitations	4-1
a.	Pulse Repetition Frequency and Range	4-1
b.	Temperature Range	4-1
c.	Radar Set Characteristics	4-1
3.	How to Operate TS-573/UP for Range Calibration, Using Internal Trigger	4-1
a.	General	4-1
b.	Procedure	4-1
4.	How to Operate TS-573/UP for Range Calibration, Using External Trigger	4-3
a.	General	4-3
b.	Procedure	4-3
5.	How to Use the Comparator Circuit of TS-573/UP	4-5
a.	General	4-5
b.	Procedure	4-5
	SECTION 5—MAINTENANCE	
1.	Routine Maintenance Check Chart	5-1
2.	Lubrication	5-1
3.	Emergency Maintenance	5-1
a.	Notice to Operators	5-1
b.	Replacement of Tubes and Fuses	5-1
4.	Trouble Shooting Information	5-1
a.	Methods of Location	5-1
b.	Data Provided	5-1

TABLE OF CONTENTS (Continued)

Paragraph	Title	Page
5.	Bench Test and Alignment Procedure	5-5
a.	General	5-5
b.	Trigger Circuits	5-5
c.	Crystal Oscillator and Hi-Speed Counters	5-5
d.	Decade and Lo-Speed Counters	5-9
e.	Coincidence and Dither Circuits	5-9
f.	Comparator Circuit	5-10
g.	Zero Error Determination	5-10
6.	Unit Testing and Repair	5-11
a.	Male Boards	5-11
b.	Female Boards	5-11
c.	Main Chassis	5-12A

SECTION 6—PARTS LIST

INDEX

LIST OF ILLUSTRATIONS

Figure	Title	Page
	SECTION 1—GENERAL DESCRIPTION	
1-1	Range Calibrator TS-573/UP	1-0
	SECTION 2—THEORY OF OPERATION	
2-1	Functional Block Diagram TS-573/UP	2-0
2-2	Basic Binary Counter Circuit	2-2
2-3	Decade Counter Operation (E401, E501, E601)	2-4
2-4	Low speed, 100,000-yard Counter Operation (E701)	2-6
2-5	Range Counting and Reset Diagram	2-7
2-6	Mixer-Coincidence and Dither Circuits	2-8
2-7	Triggering Circuits	2-9
2-8	Oscillator Input	2-10
2-9	High-Speed Counter Operation	2-12
	SECTION 3—INSTALLATION	
3-1	Outline Diagram, TS-573/UP	3-3
	SECTION 4—OPERATION	
4-1	Range Calibrator TS-573/UP front panel operating controls and functions	4-2
4-2	Maximum Range vs. Trigger Repetition Frequency	4-4
	SECTION 5—MAINTENANCE	
5-1	Failure Report, Sample Form	5-0
5-2	Top and Bottom Chassis Views	5-2
5-3	Top and Bottom Chassis Views, Sub-Assemblies removed	5-3
5-4	Typical Test Waveforms, Sheet 1 of 4	5-4
5-4	Typical Test Waveforms, Sheet 2 of 4	5-6
5-4	Typical Test Waveforms, Sheet 3 of 4	5-7
5-4	Typical Test Waveforms, Sheet 4 of 4	5-8
5-5	E101 Component and Voltage Measurement Chart	5-15
5-6	E201 Component and Voltage Measurement Chart	5-16
5-7	E301 Component and Voltage Measurement Chart	5-17
5-8	E401 Component and Voltage Measurement Chart	5-18
5-9	E501 Component and Voltage Measurement Chart	5-19
5-10	E601 Component and Voltage Measurement Chart	5-20
5-11	E701 Component and Voltage Measurement Chart	5-21
5-12	E801 Component and Voltage Measurement Chart	5-22
5-13	E901 Component and Voltage Measurement Chart	5-23
5-14	Wiring Diagram, Female Board E101	5-25
5-15	Wiring Diagram, Female Board E201	5-27
5-16	Wiring Diagram, Female Board E301	5-29
5-17	Wiring Diagram, Female Board E401	5-31
5-18	Wiring Diagram, Female Board E501	5-33
5-19	Wiring Diagram, Female Board E601	5-35
5-20	Wiring Diagram, Female Board E701	5-37
5-21	Wiring Diagram, Female Board E801	5-39

LIST OF ILLUSTRATIONS (Continued)

Figure	Title	Page
5-22	Wiring Diagram, Female Board E901	5-41
5-23	Wiring Diagram, Male Board 8823450-501 (E102)	5-43
5-24	Wiring Diagram, Male Board 8823451-501 (E103)	5-44
5-25	Wiring Diagram, Male Board 8823452-501 (E104)	5-45
5-26	Wiring Diagram, Male Board 8824392-501 (E202)	5-46
5-27	Wiring Diagram, Male Board 8823047-501 (E203)	5-47
5-28	Wiring Diagram, Male Boards 8823040-501, -502 (E302, E303, E902)	5-48
5-29	Wiring Diagram, Male Board 8823023-501 (E704)	5-49
5-30	Wiring Diagram, Male Board 8823035-501 (E705)	5-50
5-31	Wiring Diagram, Male Board 8823446-501 (E802)	5-51
5-32	Wiring Diagram, Male Boards 8823026-501, -502 (E803, E804)	5-52
5-33	Wiring Diagram, Male Board 8824393-501 (E903)	5-53
5-34	Wiring Diagram, Male Board 8824394-501 (E904)	5-54
5-35	Wiring Diagram, Male Boards 8823019-501, -502, -503	5-55
5-36	Wiring Diagram, Main Chassis	5-57
5-37	Servicing Block Diagrams, TS-573/UP	5-59
5-38	Schematic Diagram, TS-573/UP	5-61

LIST OF TABLES

Table	Title	Page
	SECTION 1—GENERAL DESCRIPTION	
1-1	Front Panel Controls and Items	1-2
1-2	Equipment Supplied	1-3
1-3	Shipping Data	1-3
1-4	Electron Tube and Crystal Diode Complement	1-3
	SECTION 5—MAINTENANCE	
5-1	Tube Operating Voltage and Currents	5-12
5-2	Tube Characteristics	5-13
5-3	Winding Data	5-13
	SECTION 6—PARTS LISTS	
6-1	Weights and Dimensions of Spare Parts Boxes	6-1
6-2	Shipping Weights and Dimensions of Spare Parts Boxes	6-1
6-3	List of Major Units	6-1
6-4	Table of Replaceable Parts	6-2
6-5	Maintenance Parts Kit	6-45
6-6	Cross Reference Parts Lists	6-46
6-7	Applicable Color Codes and Miscellaneous Data	6-48
6-8	List of Manufacturers	6-49

GUARANTEE

The equipment including all parts and spare parts, except vacuum tubes, batteries, rubber and material normally consumed in operation, is guaranteed for a period of one year from the date of delivery of the equipment to and acceptance by the Government with the understanding that all such items found to be defective as to material, workmanship or manufacture will be repaired or replaced, f.o.b. any point within the continental limits of the United States designated by the Government, without delay and at no expense to the Government, provided that such guarantee will not obligate the Contractor to make repair or replacement of any such defective items unless the defect appears within the aforementioned period and the Contractor is notified thereof in writing within a reasonable time and the defect is not the result of normal expected shelf life deterioration.

To the extent the equipment, including all parts and spare parts, as defined above, is of the Contractor's design or is of a design selected by the Contractor, it is also guaranteed, subject to the foregoing condition, against defects in design with the understanding that if ten percent (10%) or more of any such said item, but not less than two of any such item, of the total quantity comprising such item furnished under the contract, are found to be defective as to design, such item will be conclusively presumed to be of defective design and subject to one hundred percent (100%) correction or replacement by a suitably redesigned item.

All such defective items will be subject to ultimate return to the Contractor.

In view of the fact that normal activities of the Naval Service may result in the use of equipment in such remote portions of the world or under such conditions as to preclude the return of the defective items for repair or replacement without jeopardizing the integrity of Naval communications, the exigencies of the Service, therefore, may necessitate expeditious repair of such items in order to prevent extended interruption of communications. In such cases the return of the defective items for examination by the Contractor prior to repair or replacement will not be mandatory. The report of a responsible authority, including details of the conditions surrounding the failure, will be acceptable as a basis for affecting expeditious adjustment under the provisions of this contractual guarantee.

The above one year period will not include any portion of time the equipment fails to perform satisfactorily due to any such defects, and any items repaired or replaced by the Contractor will be guaranteed anew under this provision.

INSTALLATION RECORD

Contract Number NObsr-52327 Date of Contract, 17 September 1952

Serial Number of equipment .....

Date of acceptance by the Navy .....

Date of delivery to contract destination .....

Date of completion of installation .....

Date placed in service .....

Blank spaces on this page shall be filled in at time of installation. Operating personnel shall also mark the "date placed in service" on the date of acceptance plate located below the model nameplate on the equipment, using suitable methods and care to avoid damaging the equipment.

REPORT OF FAILURE

Report of failure of any part of this equipment, during its entire service life, shall be made to the Bureau of Ships in accordance with current regulations using form NAVSHIPS 383 (revised). The report shall cover all details of the failure and give the date of installation of the equipment. For procedure in reporting failures see Shipboard Radar Maintenance Bulletin, Section One.

ORDERING PARTS

All requests or requisitions for replacement material should include the following data:

1. Standard Navy stock number or, when ordering from a Marine Corps or Signal Corps supply depot, the Signal Corps stock number.
2. Name and short description of part.

If the appropriate stock number is not available the following shall be specified:

1. Equipment model or type designation, circuit symbol, and item number.
2. Name of part and complete description.
3. Manufacturer's designation.
4. Contractor's drawing and part number.
5. JAN or Navy type number.

DESTRUCTION OF ABANDONED MATERIAL IN THE COMBAT ZONE

In case it should become necessary to prevent the capture of this equipment, and when ordered to do so, DESTROY IT SO THAT NO PART OF IT CAN BE SALVAGED, RECOGNIZED, OR USED BY THE ENEMY. BURN ALL PAPERS AND BOOKS.

Means:

1. Explosives, when provided.
2. Hammers, axes, sledges, machetes, or whatever heavy object is readily available.
3. Burning by means of incendiaries such as gasoline, oil, paper or wood.
4. Grenades and shots from available firearms.
5. Burying all debris, where possible and when time permits.
6. Throwing overboard or disposing of in streams or other bodies of water.

Procedure:

1. Obliterate all identifying marks. Destroy nameplates and circuit labels.
2. Demolish all panels, castings, switch and instrument boards.
3. Destroy all controls, switches, relays, connections and meters.
4. Rip out all wiring and cut interconnections of electrical equipment. Smash gas, oil, and water cooling systems in gas engine generators, etc.
5. Smash every electrical or mechanical part, whether rotating, moving or fixed.
6. Break up all operating instruments such as keys, phones, microphones, etc.
7. Destroy all classes of carrying cases, straps, containers, etc.
8. Bury or scatter all debris.

DESTROY EVERYTHING!

SAFETY NOTICE

The attention of officers and operating personnel is directed to Chapter 67 of the Bureau of Ships Manual or superseding instructions on the subject of radio-safety precautions to be observed.

This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment.

While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS:

Operating personnel must at all time observe all safety regulations. Do not change tubes or make adjustments inside equipment with high voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. To avoid casualties always remove power and discharge and ground circuits prior to touching them.

DON'T SERVICE OR ADJUST ALONE:

Under no circumstances should any person reach within or enter the enclosure for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

DON'T TAMPER WITH INTERLOCKS:

Do not depend upon door switches or interlocks for protection but always shut down motor generators or other power equipment. Under no circumstances should any access gate, door, or safety interlock switch be removed, short-circuited, or tampered with in any way, by other than authorized maintenance personnel, nor should reliance be placed upon the interlock switches for removing voltages from the equipment.

RESUSCITATION

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION BY THE PRONE PRESSURE METHOD SHALL BE PROMINENTLY DISPLAYED IN EACH RADIO, RADAR, OR SONAR ENCLOSURE. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.

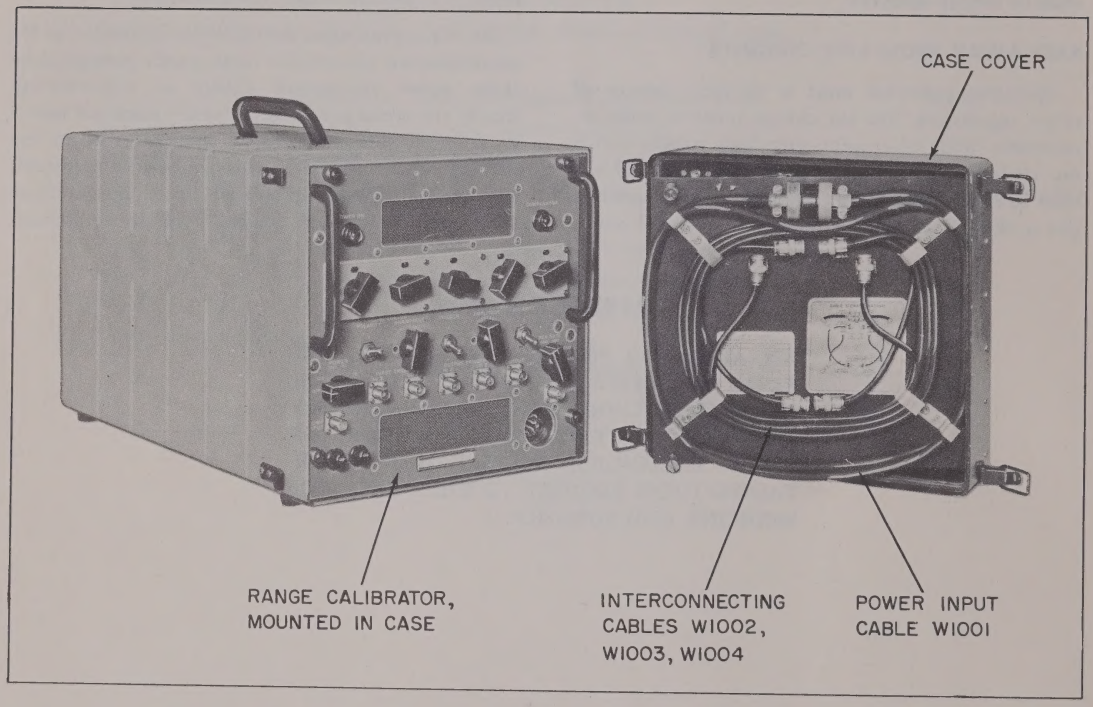


Figure 1-1. Range Calibrator TS-573/UP

SECTION 1
GENERAL DESCRIPTION

1. PURPOSE AND PRINCIPLES OF OPERATION.

The Range Calibrator TS-573/UP is a portable, precision, radar range calibrator test set. It provides a strobe output to calibrate the range circuits of pulse-type radar equipments. The strobe output may be adjusted in 10-yard steps for any range between the limits of 100 to 399,990 yards *plus* the inherent "zero error" of the particular unit. This sets the actual range limitations of the strobe output between approximately 400 and 400,200 yards. Range Calibrator TS-573/UP may also be used to determine the range of an external marker by comparing this marker input with the TS-573/UP strobe. This can be done either by the comparator circuit of Range Calibrator TS-573/UP or on an external test scope.

NOTE

The "zero error" of Range Calibrator TS-573/UP is a correction range figure individually measured for each unit at the factory, and provided with the unit. The zero error represents the sum of circuitry delays (on the order of 200 yards) affecting the precision output, inherent with each unit. This is a fixed error, and must be added to the RANGE IN YARDS indication of Range Calibrator TS-573/UP, to give the exact range in yards of the strobe output. The zero error may vary from unit to unit, and may change within a unit if components are replaced. A method of determining and checking the zero error is given in paragraph 5*g* of the Maintenance Section.

Basically, Range Calibrator TS-573/UP utilizes a precision, crystal-controlled oscillator to generate a standard signal equivalent to a range of 25 yards per cycle. These 25-yard measuring units pass through a gated amplifier, opened at the start of the counting cycle by the triggering source, to feed a fixed counting network which produces an output pulse for every four input pulses. These output pulses occur at exact 100-yard intervals and are fed to an adjustable counting network which counts the number of 100-yard input pulses selected by its four corresponding front panel range dials. In setting the front panel dials to the desired range, the adjustable counting network is pre-set to reach the selected range when that number of 100-yard input pulses have been counted. At that instant coincidence of the counting network occurs, and causes the coincidence circuit to trigger the initial output blocking oscillator. This triggers the final output blocking oscillator through a time delay network variable in 10-yard steps, and the resultant output is the strobe at the desired range. The gated circuit is then closed to end the counting cycle, at the same time that the counting circuits are reset for the next counting cycle. This occurs at the repetition frequency of the trigger, external or internal, operating the gated circuit.

The gated circuit through which the 25-yard cycle signal passes is operated independently by the system trigger, which may be derived from either an internal or external source. Since this pulse repetition frequency is not synchronized with the standard crystal oscillator frequency, a dither compensator circuit automatically injects a bias voltage to adjust timing of the strobe output (in the initial blocking oscillator stage), so that jitter of the output strobe is eliminated.

Jacks are provided on the front panel so that an external trigger may be received, and so that a synchronized output trigger is available for equipment under test as well as for connection of a test oscilloscope.

The comparator circuit utilizes a pentode mixer stage biased beyond cut-off. The marker pulse under test is applied to the control grid while the output of the final blocking oscillator stage is applied to the suppressor grid. By varying either the range control dials or the marker pulse range, the two pulses may be caused to occur simultaneously. At this point of coincidence, the mixer stage produces an output which triggers a multivibrator and causes the COMPARATOR indicator to glow.

2. DESCRIPTION.

a. Range Calibrator TS-573/UP is housed in a Navy light gray aluminum combination case 13¼-in. wide, 12-in. high, and 23-in. long. It may be operated from the front panel, without necessity of removing the chassis from its cabinet case. The case has four rubber feet. The equipment weighs approximately 43 lbs. A gasketed front cover, held to the chassis case by four trunk latches, protects the front panel when the equipment is not in use. The power cord and requisite operating cables are held on the hinged panel of this cover by clips. By loosening two captive thumbscrews in the panel, it may be swung open to reveal a compartment in which the instruction book is stored.

TABLE 1-1. FRONT PANEL CONTROLS AND ITEMS

DESIGNATION	SYMBOL	FUNCTION
POWER ON indicator	I1001	Glows if power on is sufficient for normal operation.
COMPARATOR indicator	I901	Glows when marker input at J802 is in coincidence with range strobe.
RANGE IN YARDS	S701, S601, S501, S401, S103	Indicates yardage of range strobe output from 000,100 yards to 399,990 yards.
COMPARATOR POLARITY	S801	Adjusts input to receive marker of polarity available at J802.
COMPARATOR SHARPNESS	R816	Controls range over which coincidence may be obtained.
TRIGGER	S102	Selects output polarity at J104/J105. Set to match polarity of trigger input at J101/J102 when S101 is in EXT. selection.
OUTPUT AMPLITUDE	R129	Gain control for output at J103.
OUTPUT POLARITY	S104	Selects output polarity at J103.
POWER control	S1001	Controls application of power.
REP RATE	S101	Selects external trigger or pulse repetition frequency of internal trigger.
COMP INPUT	J802	Input jack for marker from radar set for range check and adjustment.
INPUT TRIGGER	J101	HI Z jack for input of external trigger.
	J102	LO Z jack for input of external trigger.
OUTPUT TRIGGER	J104	HI Z jack for output trigger.
	J105	LO Z jack for output trigger.
OUTPUT	J103	Output jack for range strobe.
SCOPE	J106	Output jack for synch pulse to test oscilloscope.
3A fuse	F1001	Overload protection.
3A fuse	F1002	Overload protection.
Power cable connector	J1001	Power input connection.

The chassis front panel contains all operating controls, connections, and two screened openings for air intake. The designation and function of all front panel items are give in Table 1-1.

The circuits of the unit are constructed on 30 individual melamine boards, each board containing one or two tubes and the stage components. These circuit boards, referred to as "male boards," in groups of two, three, or four, plug into nine secondary sub-assembly boards, referred to as "female boards." The male boards plugging into these secondary sub-assembly terminal boards perform related functions so that a separate series of symbol designations is assigned to each female board. The nine female sub-assemblies plug into the main chassis, each through a 21-point plug which fits a mating receptacle on the main chassis. The female boards are vertically held to the chassis by two ¼-turn fasteners on each board. Five of the nine female boards are mounted on the top side of the chassis, while the remaining four boards have extenders by which they are fastened to the bottom side of the chassis, clear of the wiring. All nine female boards are symbolized by terminal board number, and have etched partial circuit diagrams on the inside and outside surfaces of their aluminum cover plates. These partial wiring diagrams indicate the location of each component (by symbol designation) on the terminal board, and show sufficient connections so that the components may be correctly identified. The diagram of the female board is illustrated on the inside surface; on the etched outer surface the diagrams of the male boards are shown in their corresponding physical location, together with their terminal board and identification numbers. This enables correct placement of the male boards on the female side, because many of the male boards are electrically identical and interchangeable, they are symbolized only by their manufacturing identification number. However, because it is physically possible to interchange a few of the boards which are not electrically identical, care should be taken to place each board in its proper location.

b. The power supply, blower assembly, and other large components mount directly on the main chassis. The parallel arrangement of the sub-assemblies provides clear paths for the flow of cooling air from the intake screens on the front panel to the rear exhaust opening. The back cover plates on the female boards add rigidity to these assemblies, provide electrical shielding, and help in reduction of "hot spots" caused by the adjacent tubes, through conduction.

3. REFERENCE DATA.

a. GENERAL.

(1) Nomenclature of equipment: Range Calibrator TS-573/UP.

(2) Contract number: NObsr-52327; contract date.

(3) Contractor: Radio Corporation of America, RCA Victor Division, Camden, New Jersey.

(4) Cognizant Naval Inspector: Inspector of Naval Material, Camden, New Jersey.

(5) Number of packages involved per complete shipment of equipment: two, including equipment spare parts.

(6) Total cubical contents (approximate) of equipment, including equipment spare parts: crated 8.5 cu. ft.; uncrated 2.3 cu. ft.

(7) Total weight (approximate) of equipment, including spare parts: crated 150 pounds; uncrated 69 pounds.

b. ELECTRICAL CHARACTERISTICS.

The equipment operates from a 115-volt ±10%, 50-1,000 cycle, single-phase power source. Total power consumption is approximately 110 watts.

Range Calibrator TS-573/UP is capable of calibrating radar sets having any of the following characteristics:

Repetition rate from 47 to 5,000 pulses per second, with up to ±10% jitter.

Pulse widths from 0.1 to 6 microseconds, of 10-volt amplitude.

Range presentations using sweeps from 1,000 to 400,000 yards.

Automatic or manual tracking.

The range indications of the strobe output are accurate to within ± (0.01% plus 10 yards).

The strobe output may be varied from the constant zero error plus 100 to 399,990 yards, can be of either negative or positive polarity, and has a minimum amplitude of 0.5 volt when the AMPLITUDE control is at maximum gain.

c. EQUIPMENT LISTS. In Table 1-2 is listed the equipment supplied. No equipment (other than required test equipment usually found in any test laboratory) is required that is not shipped under the subject contract. Shipping data is given in Table 1-3.

TABLE 1-2. EQUIPMENT SUPPLIED

QUANTITY	NAME OF UNIT	DESIGNATION	DIMENSIONS (INCHES)			VOLUME (CU. FT.)	WEIGHT (LBS.)
			HEIGHT	WIDTH	DEPTH		
1	Range Calibrator	TS-573/UP	12	13	22½	2.1	44¼
1	Set of Equipment Spare Parts						

TABLE 1-3. SHIPPING DATA

BOX NO.	NAME	DESIGNATION	DIMENSIONS (INCHES)			VOLUME (CU. FT.)	WEIGHT (LBS.)
			HEIGHT	WIDTH	DEPTH		
MI-18284 BOX 1 of 1	Radar Range Calibrator	TS-573/UP	20½	21½	33	8.3	130
MI-18285-1 BOX 1 of 1	Equipment Maintenance Spares for TS-573/UP	—	6	6	12	0.25	20

TABLE 1-4. ELECTRON TUBE AND CRYSTAL DIODE COMPLEMENT

SUB-ASSEMBLY	NUMBER OF TUBES OF TYPE INDICATED					CRYSTAL DIODES
	6BF7 OR 6BF7W	5784	5840	5902	TOTALS	TYPE G5S3
E101	3	—	—	1	4	1
E201	1	2	—	—	3	2
E301	—	—	4	—	4	4
E401	4	—	—	—	4	10
E501	4	—	—	—	4	8
E601	4	—	—	—	4	8
E701	5	—	—	—	5	5*
E801	1	2	—	—	3	—
E901	2	—	2	—	4	5
Chassis	—	—	—	—	—	3
TOTALS	24	4	6	1	35	46

* Equipments bearing serial numbers 1 through 495, 800 through 822, use four type G5S3 crystal diodes in sub-assembly E701. Therefore the total number of diodes is 45 for these equipments.

SECTION 2
THEORY OF OPERATION

1. GENERAL.

a. PURPOSE OF EQUIPMENT.—Range Calibrator TS-573/UP is a portable, precision, radar range calibrator test set used in calibrating the range units of pulse type radar equipments. To do this Range Calibrator TS-573/UP provides a strobe output, variable in 10-yard steps from approximately 400 yards to 399,990 yards, and occurring at either an external or one of five internal triggering repetition rates. The unit can also determine the range of an external range mark input, by comparing this marker input with its own output strobe, and lighting a neon lamp indicator when the two pulses coincide.

NOTE

A strobe, as defined in this instruction book, is a movable range marker whose position on the sweep of a radar time base may be manually adjusted.

b. PRINCIPLES OF OPERATION.—Range Calibrator TS-573/UP is basically a time-measuring device. The measuring unit originates with the output of a standard crystal oscillator, whose frequency of 6.55598 mc/sec corresponds to a radar range of 25 yards per cycle. The equivalence of time to distance is premised on the fact that the propogation velocity of a radar wave is a constant. Hence, a given unit of time always represents a fixed distance. After dividing the above precision frequency by four, pulses spaced at 100-yard intervals are obtained. Counting circuits enable any discrete number of these 100-yard pulses to be counted before an output pulse is provided. We thereby have a means for providing a precision strobe output.

Refer to figure 2-1. Operation of Range Calibrator TS-573/UP is initiated in the trigger circuits, which trigger the gate generator at the start of each counting cycle to open the gated amplifier. The standard crystal oscillator output may then pass through to a fixed high-speed counter. The initiating trigger pulse is either an external trigger received through the front panel INPUT TRIGGER jack, or an internally generated trigger with a pulse repetition frequency of 160, 480, 800, 1200, or 2400 pulses per second. The fixed high-speed counter divides the crystals frequency input by four, to provide output pulses spaced at exact 100-yard intervals.

These 100-yard pulses feed into an adjustable counting network comprised of four cascaded counters, each of whose counting capabilities is controlled by a front panel switch. The first three counters are similar dec-

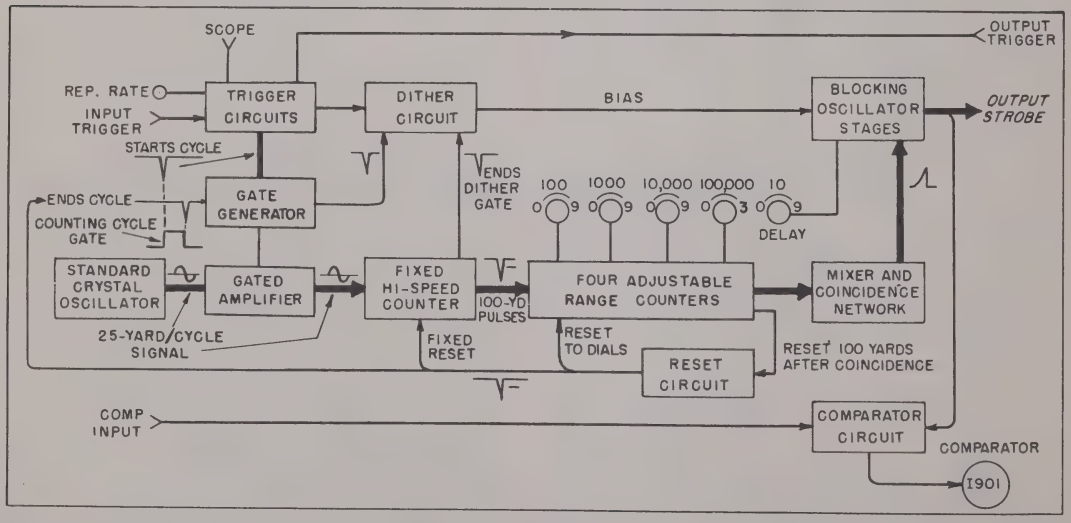


Figure 2-1. Functional Block Diagram TS-573/UP

ade counters, each with a counting capacity of ten, while the fourth counter has a counting capacity of four. The terminal count of a counter is that count during which a particular configuration of conducting and cut-off tube sections prevail permitting a coincidence output to be developed. Coincidence of the overall counting network occurs when all four of the individual counters are simultaneously at their terminal count. This total terminal count of the adjustable counting network is the coincidence point of each counting cycle, and is reached when the network has counted the number of 100-yard pulses determined by the four front panel control dials of the network. Since these dials are calibrated directly in range, from 0000 to 3999 hundred-yards, the number of 100-yard input pulses counted during each counting cycle corresponds to the selected range. Thus, if the four dials were set at 2487, then the terminal count and coincidence would be reached at the 2487th 100-yard input pulse. By the same reasoning, the maximum range of the equipment is therefore the highest dial selection of 3999, which corresponds to 3999 hundred-yard units of range. This actually is the case, excepting for the fixed inherent range error of the equipments added to all dial selections, and the range added by the 10-yard dial selector.

At the terminal count of the adjustable counting network, a coincidence pulse is generated to trigger the first of two triggered blocking oscillator stages. The output of the first blocking oscillator stage enters a nine-section time delay network controlled by the 10-yard switch. This may add an additional delay time equivalent of 0 to 90 yards by picking off the pulse at the desired point on the delay network before triggering the final blocking oscillator stage. The output of this stage is the range pulse, a 0.6-microsecond pulse of approximately 1.0 volt amplitude, which may be provided as either a positive-going or negative-going strobe.

On the next 100-yard input pulse (4000th or 0000) after coincidence, the reset circuit is triggered to bring an end to the counting cycle. The output of the reset circuits resets the four adjustable counters and the fixed high-speed counter for the next counting cycle. At the same time, the gate generator is triggered to shut off the gated amplifier. This stops the input to the fixed high-speed counter, which then can no longer feed 100-yard pulses to the adjustable counting network. The next counting cycle starts when the gate generator is again triggered to open the gated amplifier.

Since there is no synchronism between the crystal oscillator frequency and the repetition frequency of the triggering circuit, the first input signal to the high-speed counter occurring after the gated amplifier has been gated on, may happen at any time between zero and 0.15 microsecond (the approximate time corresponding to the 25-yard/cycle period). This time interval may vary for each cycle of the triggering circuit, and would cause the strobe output to jitter were it not for the action of the dither circuit. The dither circuit measures this small variable time interval between the gate opening and the first output signal from the high-speed counter, and provides an output voltage proportional to this time delay. This output voltage is applied as a variable bias to the first blocking oscillator stage and controls its firing time to eliminate the jitter.

The strobe output is also applied to the comparator circuit where, if it coincides with a range mark input received through the front panel jack COMP INPUT, a neon lamp COMPARATOR indicator glows. The comparator circuit consists of a pentode mixer stage and a multivibrator. The strobe output is applied to the suppressor grid of the cut-off mixer stage, which will only pass a signal (to light the indicator) when its suppressor and control grids are simultaneously driven positive. By applying the radar range mark to the control grid of the comparator mixer stage, and then varying the switch dials of Range Calibrator TS-573/UP until the COMPARATOR indicator lights, the range of the radar range mark may be quickly and accurately determined.

In performing its functions, Range Calibrator TS-573/UP may either provide a synchronizing trigger for itself and for the radar equipment under test through its front panel OUTPUT TRIGGER jack, or it may receive a synchronizing trigger from the radar equipment under test through its front panel INPUT TRIGGER jack. Another front panel jack, SCOPE, provides a synchronizing trigger for an oscilloscope useful for trouble-shooting either Range Calibrator TS-573/UP or the radar equipment under test.

Test-point jacks are conveniently provided on the nine female boards at pertinent points in the circuitry, for test and servicing purpose. A test switch (S702) mounted inside the unit on the chassis, enables the reset circuit to be triggered independently of the counting network to facilitate trouble-shooting the counters and the reset channels. With S702 in TEST position, the internal trigger multivibrator stage V101 triggers the reset multivibrator V703 approximately half-way during each cycle of the internal trigger repetition frequency.

Since the basic operation of Range Calibrator TS-573/UP is dependent upon the individual binary counter stages of which the counter circuits are composed, a short discussion on binary counters is given in the following paragraph. This basic binary counter circuit is used extensively throughout the equipment.

c. BINARY COUNTERS.

(1) All counter stages in the equipment are Eccles-Jordan type bi-stable (flip-flop) multivibrators. In this circuit two triodes (or pentodes) are so connected that when either one conducts the other is cut off. The multivibrator is stable in either of its two states of conduction, and can be reversed only by an externally applied triggering pulse. Refer to figure 2-2. Assume that section B of MV-1 is conducting when the first negative input pulse is applied, so that its plate is at the less positive of its two equilibrium voltages. The negative pulse cuts off the conducting section B, and through multivibrator action causes section A to conduct. The circuit conditions have reversed and the plate of section B rises to its more positive voltage. The second negative input pulse again reverses the operation returning the plate voltage of B to its lower value. The output voltage thus completes one cycle of a square wave for each two input pulses.

The square wave output of each multivibrator stage is differentiated (by coupling capacitor C and resistor R) to produce sharp positive and negative pulses. The positive pulse has no effect upon the succeeding stage; only the negative pulse may get through to reverse conditions in that next stage. Germanium diodes permit only the negative pulses to pass in the circuit illustrated by MV-1. This basic circuit is used extensively throughout the equipment.

By referring to the plate voltage waveforms in figure 2-2, it is evident that each counter and differentiating stage divides its input count by two. Thus, if several stages are cascaded, the counting capacity of the circuit will be 2^n (two to the nth power where n represents the number of stages). Since, for each stage, two input pulses are necessary for every output pulse, they are called binary counters. A four-stage binary counter will therefore normally count 16 input pulses for every output pulse.

(2) By the use of feedback, this normal counting ratio of a four-stage binary counter may be reduced from 16 to ten, to produce a decade counter. Pulses are fed back from the last stage to preceding stages to shorten the normal counting cycle so that the fourth stage will complete one cycle for only ten input pulses to the first stage.

(3) Reset pulses may be fed to the various stages of a binary counter, and can set the counter in any desired condition for a selected range. Negative reset pulses are inserted into the grid circuits of one tube section in each multivibrator stage. They have no effect upon a non-conducting section but cut off the conducting sections to reverse the multivibrator condition. In this manner, a binary counter may be set

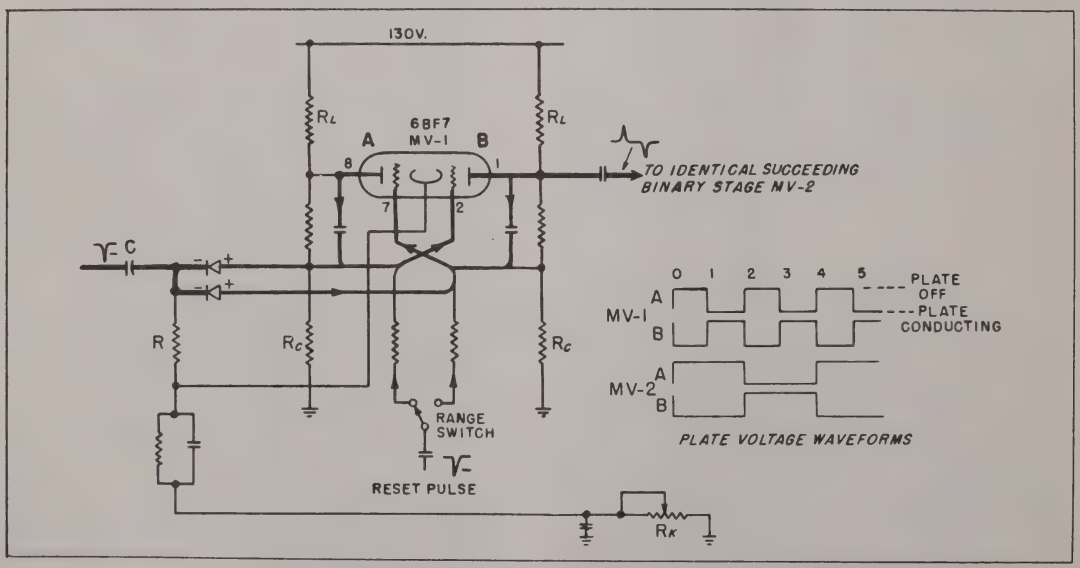


Figure 2-2. Basic Binary Counter Circuit

so that a desired number of input pulses will bring that particular counter to its terminal count. As will be noted later on, successful operation of the adjustable counters and the equipment is based upon this ability.

d. MECHANICAL ARRANGEMENT.—The power supply components, blower motor, pulse transformers, and associated items, together with nine removable sub-assemblies are mounted on the main chassis. All electron tube stages of the unit are mounted on these nine sub-assembly terminal boards, referred to as "female boards". These female boards are vertically stagger-mounted to the chassis, four on the underside and five on the top. A 21-point plug at the center of each female board fits a mating receptacle permanently mounted on the main chassis. Each of the nine boards may quickly be removed from the main chassis by unscrewing two ¼-turn fasteners.

Thirty separate terminal boards, referred to as "male boards", separately plug into these nine female boards. The wiring of the female board is concealed by a back cover plate, on the inside of which is illustrated a component-identifying diagram of the female board. Diagrams of the male boards are direct-etched on the outside of the cover plate.

The parallel arrangement of the female boards allows open paths for cooling the unit by the flow of air from the intake screens on the front panel out through the rear exhaust opening.

2. RANGE COUNTING FUNDAMENTALS.

a. BASIC INFORMATION.—The output of Range Calibrator TS-573/UP is a strobe occurring at precisely the number of yards selected on the five front panel dials of the unit, plus the inherent range error of the unit. This output is provided by the combined action of several circuits, which directly affect the output range. These circuits are:

The adjustable counting circuit, which counts 100-yard pulses until the terminal count is reached. This occurs when the number of 100-yard input pulses reaches the number selected on the four front panel dials of the adjustable counters. The mixer-coincidence circuit then triggers the first of two triggered blocking oscillators.

The dither circuit, which measures the delay time between each counting cycle initiating trigger and the first 25-yard/cycle signal passed through the gated amplifier. It compensates for this delay when its output voltage adjusts the firing instant of the triggered blocking oscillator mentioned in the above paragraph.

The delay line, which in corresponding 10-yard steps from 0 to 90 yards, delays triggering of the second blocking oscillator output stage so that the strobe output occurs at the selected range.

The accuracy of the unit is controlled by a crystal oscillator operating at 6.55598 mc/sec, which corresponds to 25-yard intervals. A fixed high-speed counter circuit counts these pulses, and provides pulses timed at 100-yard intervals to the variable range counting circuits, which alone is considered under this paragraph heading. The other circuits are described under the paragraph heading of the female terminal boards on which they are physically located.

TERMINOLOGY.—To avoid misunderstanding, some commonly used terms are defined as follows:

Counter. A counting circuit consisting of several binary stages.

Decade Counter. A four-stage binary counter circuit employing feedback so that it has a counting capacity of ten.

Count. The count of a single counter, or several cascaded counter circuits, represents the set of on and off conditions for each stage in those counters between successive input pulses.

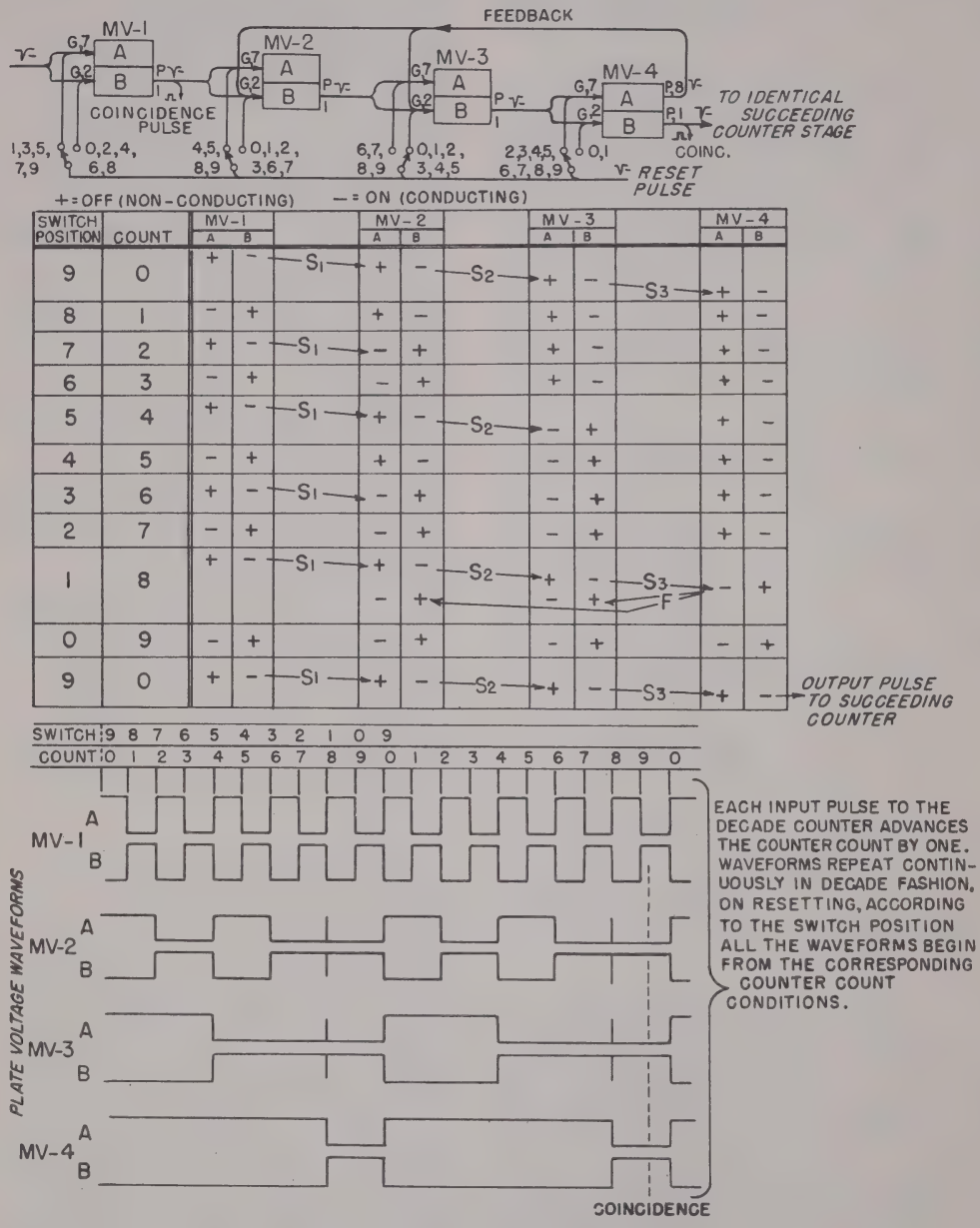
Terminal Count. The terminal count of a counting circuit is an arbitrarily selected count during which a particular desired set of conditions exist; in this equipment it is the coincidence condition of the counter.

Gated On or Gate Open. The condition of the gated amplifier stage in which it passes an input signal.

Gated Off or Gate Closed. The condition of the gated amplifier stage in which it does not pass an input signal.

b. ADJUSTABLE COUNTING CIRCUIT.

(1) GENERAL.—The adjustable counting circuit consists of four cascaded counters, one for each of the hundreds, thousands, ten-thousands, and hundred-thousands, RANGE IN YARDS selectors. It is the function of the adjustable counting circuit to reach its terminal count after it has received the number of 100-yard input pulses selected on the RANGE IN YARDS four dial switches and produce a coincidence output. When the terminal count (which numerically corresponds to the maximum dial selection of 3999) is reached, the mixer circuit produced a coincidence pulse which feeds into the first of two triggered blocking oscillator output stages. Upon the next 100-yard input pulse, advancing the count to 4000 or 0000, the reset circuit produces a pulse which resets the four counters for the next counting cycle to the range selected by the first four RANGE IN YARDS dials.



SWITCH POSITION	COUNT	MV-1 A	MV-1 B	MV-2 A	MV-2 B	MV-3 A	MV-3 B	MV-4 A	MV-4 B
9	0	+	−	+	−	+	−	+	−
8	1	−	+	+	−	+	−	+	−
7	2	+	−	−	+	+	−	+	−
6	3	−	+	−	+	+	−	+	−
5	4	+	−	+	−	−	+	+	−
4	5	−	+	+	−	−	+	+	−
3	6	+	−	−	+	−	+	+	−
2	7	−	+	−	+	−	+	+	−
1	8	+	−	+	−	+	−	−	+
				−	+	−	+		
0	9	−	+	−	+	−	+	−	+
9	0	+	−	+	−	+	−	+	−

Figure 2-3. Decade Counter Operation (E401, E501, E601)

If, for example, the selected range in yards should be 354,680 (the final two digits are of no significance here), then the count of the four adjustable counters would automatically be pre-set to 0453 (the selected count of 3546 subtracted from the terminal count of 3999).

The hundreds, thousands, and ten-thousands divider chains are similar decade counters. The hundred-thousands divider is a two-stage binary counter with the counting capacity of four between terminal counts. The decade counters are described in the following sub-paragraph (2). Each of the adjustable counter circuits is built on a separate female terminal board, and is controlled by a front panel dial switch which automatically pre-sets the count when the dials are set to the desired range.

The reset pulse is applied to the grid circuits of selected counter stages, through the RANGE IN YARDS switch wafers, to pre-set the adjustable counting network for the next counting cycle.

(2) DECADE COUNTERS.—The decade counter circuit used in the hundreds, thousands, and ten-thousands counters, is a four-stage counter employing feedback to the second and third stages from the fourth. Refer to figure 2-3 which illustrates the plate voltage waveforms and indicates the plate condition of each multivibrator stage. The plus (+) marks indicate the higher plate voltage when the tube is non-conducting, and the minus (−) marks indicate the lower plate voltage when the tube is conducting.

During the counter count of zero, the four B tube sections are conducting. A negative input pulse then cuts off the MV-1B and MV-1A conducts. The positive pulse produced at the plate of MV-1B has no effect on the following stage; only negative pulses have effect as previously explained in paragraph 1c of this section. The next (second) input pulse reverses MV-1 so that a negative pulse is applied to the grid of MV-2B causing this section to cut off and MV-2A to conduct. The third input pulse only switches MV-1. The fourth input pulse switches MV-1, MV-2, and MV-3. Action thus continues in a normal fashion until the eighth pulse, when MV-1, MV-2, MV-3, and MV-4 are all switched. A negative feedback pulse is then sent from the plate circuit of MV-4A to the grid circuits of the B sections in MV-2 and MV-3, and reverses the conditions in these stages. This feedback action has the effect of six additional input pulses in a normal four-stage binary counter, in bringing sections A of MV-2 and MV-3 to a conducting status. On the next (ninth) input pulse only MV-1 is reversed. However, on the tenth input pulse, all the stages are reversed to the same condition they were in at the count of zero, so that a complete counter cycle has occurred.

Note that only at count nine (arbitrarily assigned as the "terminal count"), are the plate voltages of MV-1B and MV-4B at their higher value and the plate voltage of MV-1A at its lower value. It is only then that the counters have a useful effect on the mixer-coincidence circuit. Counters E501 and E601 utilize the positive pulse of MV-1B and MV-4B, while counter E401 uses the positive pulse of MV-4B and the negative pulse of MV-1B.

(3) COUNTER OPERATION.—The negative half-cycles of the standard crystal oscillator output, after passing through the gated amplifier, pulse the fixed high-speed counter circuit of E301. This circuit consists of two binary stages, which divide the input frequency by four to provide 100-yard input pulses for the 100-yards counter E401. However, before the first 100-yard pulse reaches E401, the four binary stages of E401 have been pre-set by the reset pulse received through the 100-YARD dial switch S401. The four binary stages of E401 are pre-set to a particular count corresponding with the dial selection. The first and succeeding 100-yard input pulses each advance the count by one, until the E401 terminal count is reached. On the next pulse into E401, the output of the B section in the fourth binary stage of E401 then swings negative and provides a 1000-yard input pulse for the 1000-yards counter E501. The 100-yards counter E401 continues counting 100-yard pulses, and for every tenth one it receives thereafter produces a 1000-yard output pulse. Thus, if the 100-YARD switch S401 were set at 6 (corresponding to a count of 3 for counter E401), the 7th, 17th, 27th, 37th, and every tenth 100-yard input pulse thereafter would effect a 1000-yard output pulse to E501.

Likewise through the 1000-YARD dial switch S501, the four binary stages of E501 are pre-set to the E501 count corresponding with the dial selection. The first and succeeding 1000-yard input pulses each advance the E501 count by one, until the E501 terminal count is reached. On the next pulse into E501, the output of the B section in the fourth binary stage of E501 goes negative, and provides a 10,000-yard input pulse for the 10,000-yards counter E601. Thereafter the counter E501 continues counting 1000-yard pulses and producing a 10,000-yard output pulse for every ten input pulses it receives thereafter. Thus, if the 1000-YARD switch S501 were set at 4 (corresponding to a count of 5 for counter E501) and the 100-YARD switch S401 remained on 6, then the 47th, 147th, 247th, and every one-hundredth 100-yard input pulse to E401,

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would cause a 10,000-yard output pulse from E501 to E601. The 47th, 147th, 247th 100-yard inputs to E401 correspond in time to the 5th, 15th, 25th 1000-yard input pulses to E501.

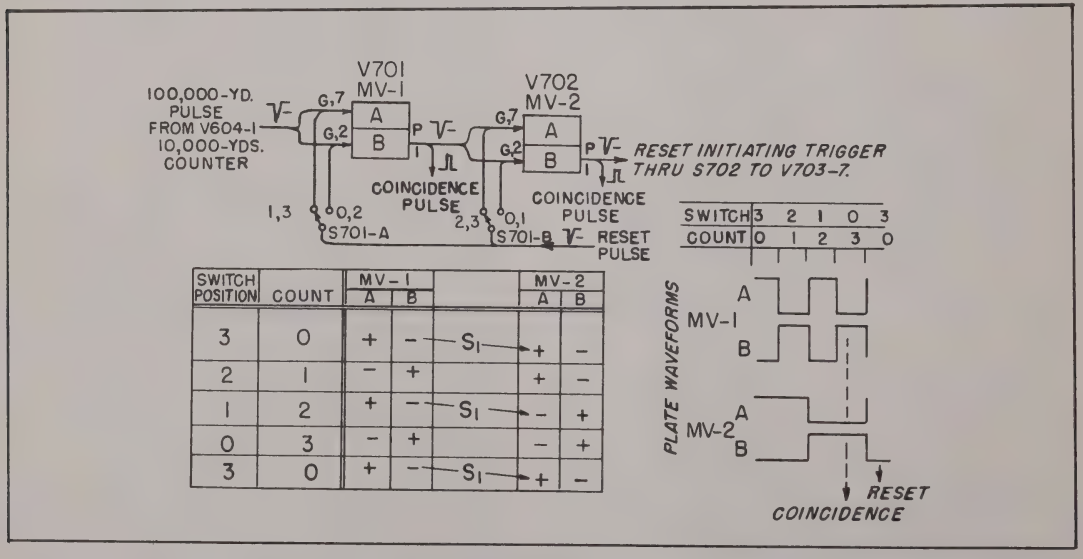
Through the 10,000-YARD dial switch S601, the four binary stages of E601 are pre-set to the E601 count corresponding with the dial selection. The operation of E601 is exactly similar to the operation of E401 and E501 described in the preceding paragraphs. The output of the B section in the fourth binary stage of E601 swings negative on the pulse after the terminal count to produce a 100,000-yard output pulse. If the 10,000-YARD switch S601 were set at 5 (corresponding to a count of 4 for counter E601) and switches S401, S501, remained at 6 and 4 respectively, the 547th, 1547th, and every one-thousandth 100-yard input pulse to E401 thereafter, would cause a 100,000 output pulse from E601 to E701. The 547th, 1547th 100-yard input pulses to E401 correspond in time to the 6th, 16th, 10,000-yard input pulses to E601.

The two binary stages of the low-speed counter E701 are pre-set to their count by the 100,000-YARD dial switch S701. Refer to figure 2-4. If S701 is set to 3 (corresponding to a count of zero), then E701 will require three input pulses from E601 to bring the binary stages of E701 to their terminal count for coincidence. These three input pulses will be the 547th, 1547th, and 2547th 100-yard input pulses received by E401, if the other range switches S401, S501, S601 remain set at 6, 4, 5 respectively. Each one of these 100,000-yard input pulses to E701 advances its count by one until the low-speed counter terminal count of three is reached. At that point (the 2547th 100-yard input pulse) the 10,000-yard counter E601 will be at its count of zero, and requires nine 10,000-yard input pulses to reach its coincidence terminal count of nine. This occurs after 900 more 100-yard input pulses are received at E401, bringing E601 to its coincidence at the network count of 3447 (2547 plus 900).

At this point (the 3447th 100-yard input pulse) the 1000-yard counter E501 is at its count of zero, and requires nine 1000-yard input pulses to reach its coincidence terminal count of nine. This occurs after 90 more 100-yard input pulses are received at E401, bringing E501 to its coincidence at the network count of 3537 (3447 plus 90). Finally, with nine more 100-yard input pulses, the 100-yard counter E401 is brought to its coincidence terminal count of nine at the 3546th received 100-yard pulse. Thus, with the 100,000-YARD dial set at 3, the 10,000-YARD dial at 5, the 1000-YARD dial at 4, and the 100-YARD dial at 6, it may be seen how the adjustable counting network reached its terminal count 3999 (corresponding to the set of conditions for coincidence), at the 3546th 100-yard pulse.

c. COINCIDENCE AND RESETTING.

(1) MIXER-COINCIDENCE CIRCUIT.—This circuit between the counting network and the output stages, enables the terminal count 100-yard input pulse to initiate the output circuits without any delay



SWITCH POSITION	COUNT	MV-1 A	MV-1 B		MV-2 A	MV-2 B
3	0	+	−	S_1	+	−
2	1	−	+		+	−
1	2	+	−	S_1	−	+
0	3	−	+		−	+
3	0	+	−	S_1	+	−

Figure 2-4. Low speed, 100,000-yard Counter Operation (E701)

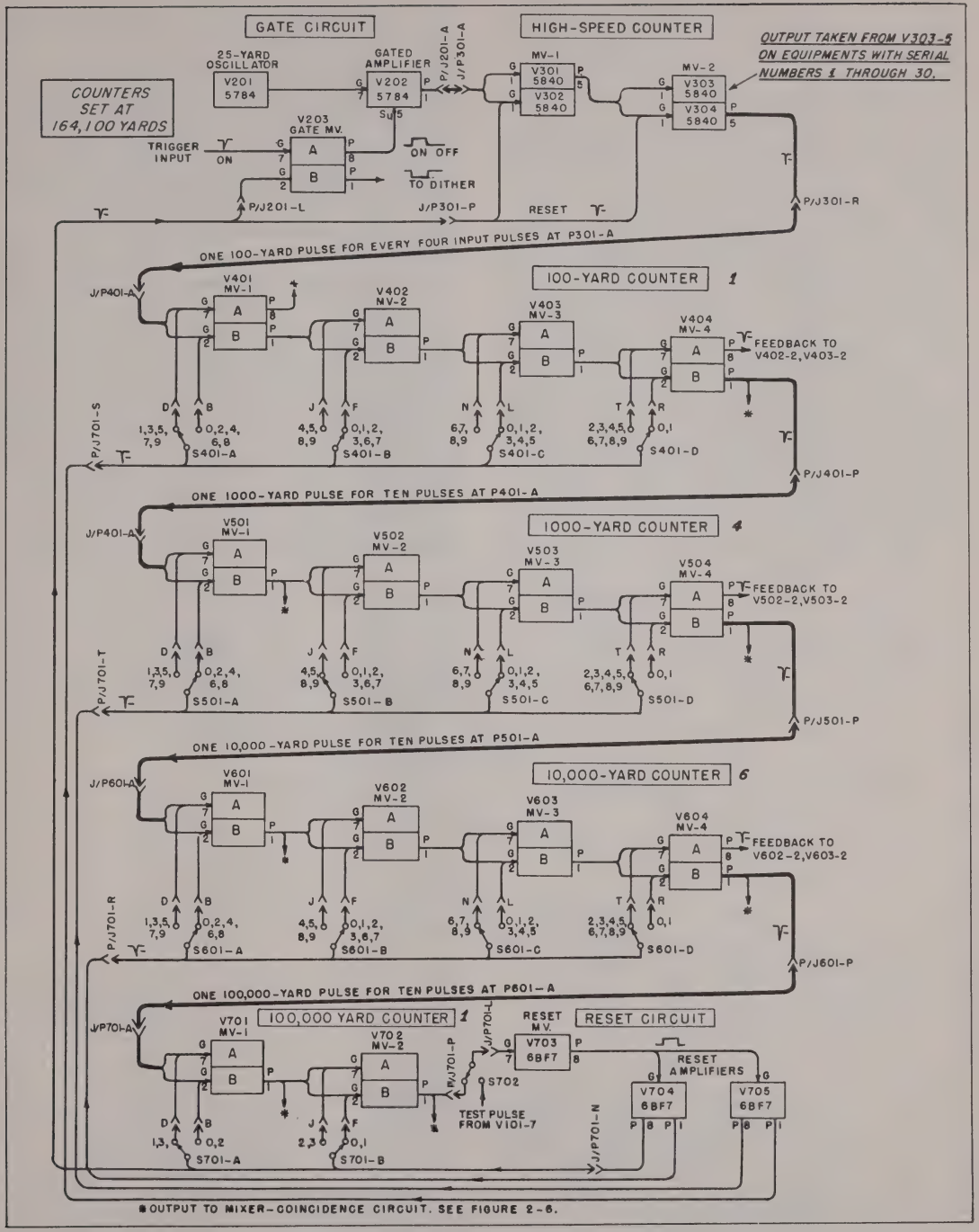


Figure 2-5. Range Counting and Reset Diagram

through the four adjustable counters. The mixer-coincidence circuit receives inputs from each of the four counters in the adjustable counting circuit, but produces an output signal only when all the input signals simultaneously are at coincidence. This occurs only when the counter network is at its terminal count. The coincidence pulse then produced is amplified and triggers the initial blocking oscillator stage of V104.

Refer to figure 2-6. The control grid of pentode mixer V802 receives a composite signal of four positive gates, two each from the B sections of the first and last binary stages in E701 and E601. In addition, another input to V802-7 is received through an amplifying stage of V801, from the first binary stage of E401 at the terminal count 3999. The suppressor grid of V802 also receives a composite signal of three positive gates, two from the B sections of the first and fourth binary stages in E501 and one from the B section of the fourth binary stage in E401. Most of these individual positive gates applied to the grids of V802 occur repeatedly during each counting cycle. However, the useful sequence in which they occur is illustrated in figure 2-6, which lists the counter count when all preceding mixer inputs are on and remain on until the terminal count (3999). Coincidence occurs at the terminal count when the inputs from V401, riding on the raised suppressor and control grid voltages, are able to overcome the tube bias applied to the cathode of V802. The mixer tube then conducts for the approximate interval of a 100-yard pulse. This negative plate output of V802 is amplified and inverted by a triode section of V903, to a positive pulse of approximately 20 volts amplitude. The leading edge of this output pulse is purposely sloped, so that when it is combined with the bias-regulating output of the dither circuit, the blocking oscillator grid V104-7 will be triggered at the proper instant. Note that the mixer-coincidence circuit prepares the four adjustable counters for coincidence in inverse circuit order; that is, the 100,000-yards counter of E701 is first prepared, then the 10,000-yards counter E601, and so on. This is purposely done so that when the 100-yard pulse preceding terminal count is measured by E301, it passes through only one binary counter stage (V401) before affecting the output circuits. Otherwise, the

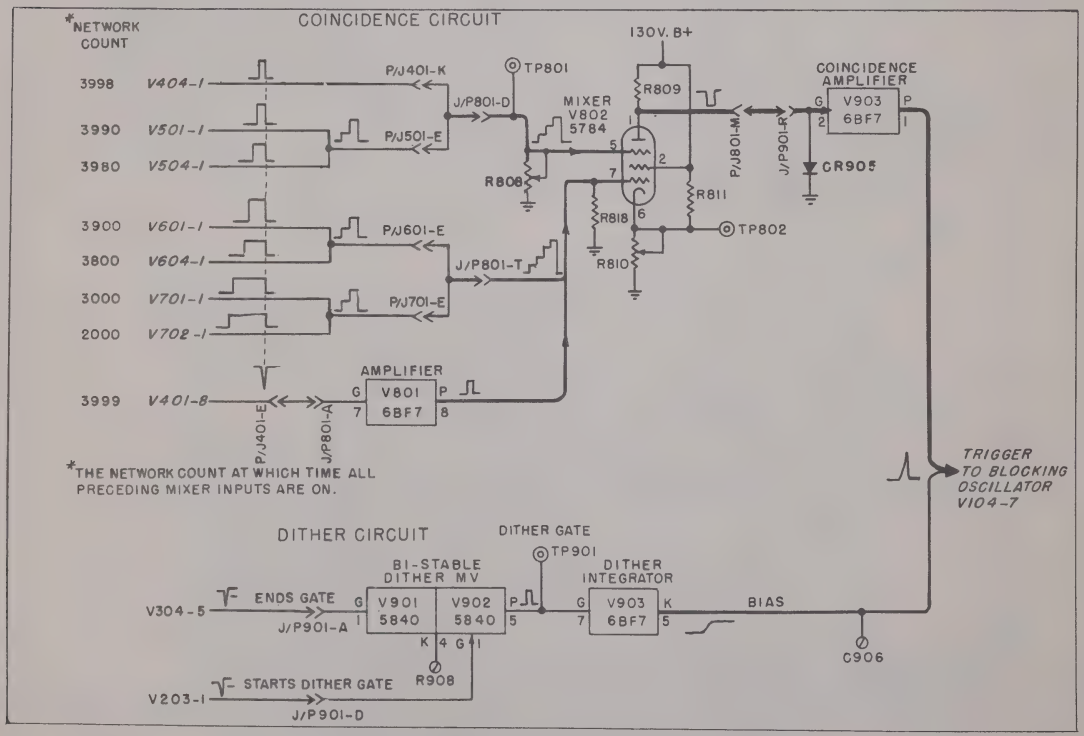


Figure 2-6. Mixer-Coincidence and Dither Circuits

equipment would suffer the additional inherent delay time of the four adjustable counting chains.

(2) RESETTING CIRCUIT.—The resetting circuit includes one multivibrator stage and two twin-triode amplifiers on terminal board E701. Refer to figure 2-5. The counting network reaches its coincidence during its terminal count. When it receives the next 100-yard input pulse, each of the four adjustable counters advance to their zero count. At this point, and only at this point, the plate of the second binary stage V702 on E701 is driven negative. This negative signal through test switch S702, triggers the monostable multivibrator stage V703. The positive multivibrator output drives the non-conducting four triode sections of reset amplifiers V704 and V705, and the resultant four negative output pulses reset the counting and associated circuits. The outputs of V705 reset the 100-yard and 1000-yard counters E401 and E501, to the count corresponding with their respective dial switch selections. Likewise, the negative output pulses of V704 reset the 10,000-yard and 100,000-yard counters, in addition to resetting the high-speed counter stages and triggering V203 to shut off the gated amplifier V202. This ends the counting cycle.

d. SUMMARY.—The counting network includes a fixed counter and an adjustable counting network. The fixed high-speed counter, through a gated amplifier stage, counts every four cycles of the standard crystal oscillator 25-yard cycle output. It feeds a continuous flow of 100-yard pulses to the adjustable counting network until the end of the counting cycle, terminated when the gated amplifier is gated off.

The adjustable counting network consists of four cascaded counters, each adjustable by a front panel control. In setting the 100,000-YARD, 10,000-YARD, 1000-YARD, and 100-YARD range dials to a desired range, the counting network is automatically adjusted so that the network terminal count (3999) is reached when the selected number of 100-yard input pulses have been counted. In effect, the network count is automatically set to 3999 less the indicated range on the first four dials. For example, if the dials were set to 271,900 yards, then the many stages of the four adjustable counters would automatically be pre-set in that condition corresponding to a network count of 1280 (2719 subtracted from 3999). Thus, when the network receives its 2719th 100-yard input pulse, the adjustable counters will have reached their terminal count for the desired 271,900-yard selection. Coincidence then occurs, and the output circuit is triggered. On the next 100-yard input pulse to the counter, the reset circuit is triggered to end the immediate counting cycle and adjust for the next counting cycle.

3. FEMALE BOARD E101.

a. TRIGGERING CIRCUITS.—Female board E101 includes three male boards, E102 through E104. Refer to figures 2-7 and 5-38, to follow the circuit description.

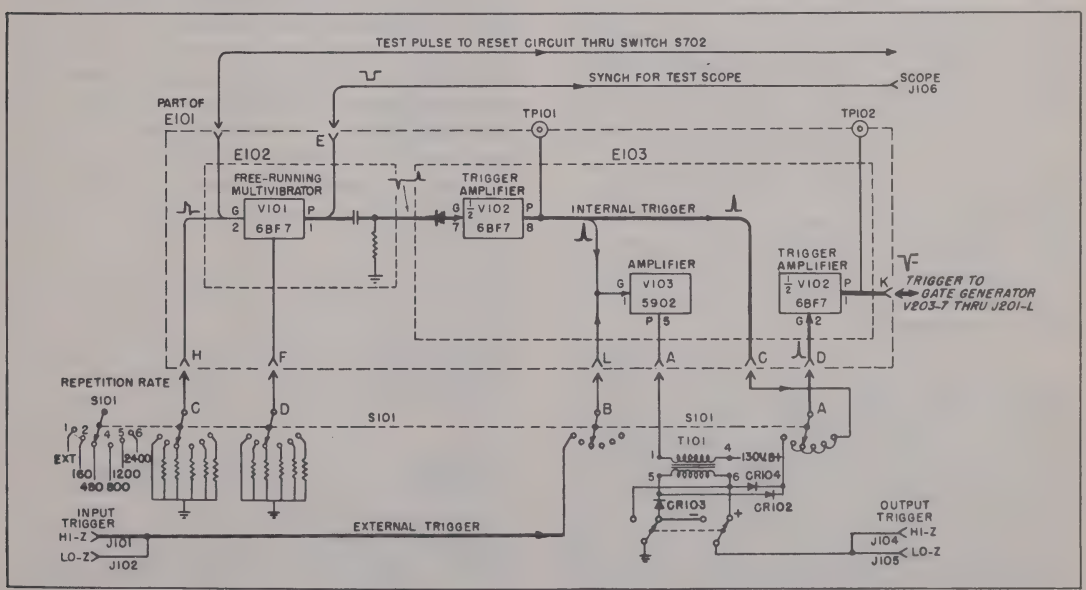


Figure 2-7. Triggering Circuits

The twin triode stage V101 on male board E102 is a free-running multivibrator oscillating at any one of five repetition rates, as selected by the REP RATE switch S101. These five rates are 2400, 1200, 800, 480, and 160 pulses per second, and are effected by switching the proper value of resistance into the grid circuits of the multivibrator through sections D and C of S101. In the first EXT position of selector S101, both grids of V101 are grounded and the multivibrator rendered inoperative. The two triode sections of V101 have the same circuit parameters, so that the resultant output is a square wave. This square wave is taken off the plate, pin 8, and through terminal E of P101/J107 connects to the TEST contact of chassis switch S702. Its negative edge triggers the reset multivibrator V703 when S702 is in TEST position. The square wave taken off the plate pin 1 of V101, through capacitor C105 connects to the SCOPE synchronizing jack J106. Through a differentiating network C104-R113 and a germanium diode CR101, the negative edge of the square wave from V101-1 is selected to drive amplifier section 5-7-8 of V102 on male board E103. See figure 2-7.

The positive pulse appearing at the plate pin 8 of V102 couples, through capacitor C107 and section A of S101, to the second amplifier section 4-2-1 of V102. A negative pulse of approximately sixty volts amplitude thus appears at plate pin 1 of V102, and triggers the gate multivibrator stage on male board E204. The same positive internal trigger pulse at pin 8 of V102, through capacitor C106 and a peaking coil L111 shunted by a damping resistor R133, feeds an amplifier stage V103. The effect of L111 is to peak the leading edge of the output trigger. The pulse thus appearing at V103-5 is coupled through transformer T101 and the polarity-switching TRIGGER selector S102, to the OUTPUT TRIGGER jacks J104 and J105 on the unit front panel. Switch S102 selects from the internal triggering source, either a positive or negative output trigger of approximately 10 volts minimum amplitude, for synchronizing an external unit. The repetition rate of this trigger will be either 2400, 1200, 800, 480, or 160, as selected by S101.

In the EXT position of S101, an external trigger received through INPUT TRIGGER jack J101 or J102, passes through section B of S101 and is amplified by V103. The output then passes through transformer T101, either rectifier CR102 or CR104, and section A of S101, to the trigger amplifier stage 4-2-1 of V102. The external trigger pulse should be at least 10 volts in amplitude, and may be either negative or positive providing the TRIGGER switch S102 is correspondingly set. The OUTPUT TRIGGER pulse at J104 and J105 will then only be positive-going, since it is essential that the input to grid pin 2 of V102 be positive.

b. BLOCKING OSCILLATOR OUTPUT CIRCUIT.—Male board E104 consists of two blocking oscillator stages, each using a section of the twin-triode tube V104. The coincidence circuit output, a positive-going pulse of approximately 18 volts amplitude, is applied to grid pin 7 through winding 4-3 of T102, and overcomes the cut-off bias on the cathode to cause tube conduction. The drop in plate voltage is transformer-coupled back to the grid as a rising voltage, to increase tube conduction and cause the sharp positive pulse in the cathode circuit. As conduction eases off, transformer action of T102 drives the grid negative to cut off the tube. The positive pulse appearing in the cathode circuit at pin 5, connects through capacitor C111 to the 10-yard delay line circuit and 0-yard contact of switch S103.

Capacitors C114 through C123, inductors L101 through L109, and the three-section switch S103 form a 0- to 90-yard delay line adjustable in 10-yard steps. The output of V104-5 passes through the selected number of 10-yard delay sections, returning through the center contact arm of S103 and capacitor C112 to the grid of output blocking oscillator section 4-2-1 of V104. In the 0-yard selection of S103, the output from V104-5 is directly connected to the center contact arm.

Section 4-2-1 of V104 is a blocking oscillator similar in operation to section 5-7-8. Normally the tube is cut off. The positive pulse applied to its grid pin 2 overcomes cut-off bias on the cathode, and the tube sharply conducts until the grid is driven negative by transformer action and cuts off tube conduction. The output trigger, taken from either terminal 5 or 6 of pulse transformer T103, may be either positive or

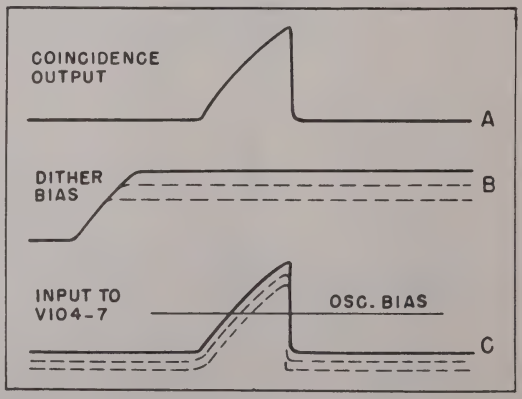


Figure 2-8. Oscillator Input

negative as selected by the POLARITY switch S104. Its amplitude at the OUTPUT jack J103 may be varied between zero and approximately one volt by the AMPLITUDE control R129.

It should be noted that the input trigger to pin 7 of the first blocking oscillator stage represents the coincidence output (delay period as selected by the first four digits of the selector dials), and includes the dither bias. See figure 2-8. The coincidence output is a pulse, and rides on the level set by the dither bias voltage. As such it overcomes the bias on grid pin 7 of V104 at the proper moment for a steady output.

4. FEMALE BOARD E201.

Female board E201 consists of three stages, each on a separate male board. These stages are the crystal oscillator, gate multivibrator, and gated amplifier circuits, and are discussed below.

a. CRYSTAL OSCILLATOR.—The crystal oscillator stage V201 is mounted on male board E202. The precision quartz crystal Y201 in the grid circuit has a resonant frequency of 6.55598 mc/sec. and may be pulled approximately ±1500 cycles by frequency-adjust capacitor C202. This fundamental frequency corresponds in time to an equivalent radar range of 25 yards per cycle. The variable inductor L201 in the plate circuit affects the amplitude of oscillation, which varies less than one volt at test jack TP201. The crystal oscillator output connects to the control grid of the gated amplifier V202, through C205.

b. GATED AMPLIFIER.—This stage V202 on male board E203 is the driver for the counting circuits, and when it is gated on passes the amplified oscillator signal to the first counter stage on male board E302. Plate conduction of V202 is controlled by the voltage applied to its suppressor grid pin 5, from the multivibrator stage V203. When this voltage gate swings positive, the crystal oscillator signal applied to the control grid is amplified in the plate circuit; otherwise tube conduction is in the screen circuit where it has no effect. The positive gate voltage remains on suppressor grid pin 5 until the end of the counting cycle, when the reset pulse shuts off the gate. The positive gate voltage is generated by the gate multivibrator stage V203, at the repetition frequency of the triggering amplifier section 4-2-1 of V102.

c. GATE MULTIVIBRATOR.—The gate multivibrator stage V203 on male board E204 is a bi-stable multivibrator which generates a gate voltage of approximately 43 volts peak. The initiating trigger is a negative pulse applied through germanium diode CR202 from the plate pin 1 of V102. This trigger causes section 5-7-8 of V203 to cut off, and through coupling capacitor C210 causes section 4-2-1 to conduct. The resultant positive gate at plate pin 8 opens the gate circuit of V202 to permit passage of the 25-yard/cycle signal. Simultaneously, the leading edge of the negative gate at plate pin 1 of V203, through C909 and CR903 resets multivibrator V905 to turn off (if on) the COMPARATOR indicator I901, and through C904 and CR902 triggers on the dither multivibrator circuit. The reset trigger fed to V203 is also a negative pulse, applied through germanium diode CR201 to grid pin 2 of V203, from the reset amplifier stage V704 pin 8. The reset trigger stops conduction of section 4-2-1, thereby causing section 5-7-8 to resume conduction. The multivibrator period (or cycle) thus occurs at the same repetition frequency as the triggering source, and the plate pin 8 positive gate width is equivalent to the range yards selected on the front panel dials except when the TEST-OPERATE switch S702 is on TEST.

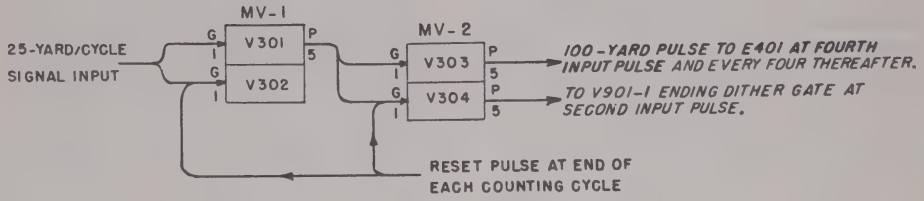
d. SUMMARY.—The free running crystal oscillator V201 generates a continuous, stable, standard 25-yard per cycle signal. This signal, fed through a gated amplifier V202, triggers the fixed high-speed counter circuit on E301. The amplifier V202 is gated on to start the counting cycle by a positive gate generated by the bi-stable multivibrator V203. This happens when V203 is triggered from either an external or internal source. When V203 is triggered by the reset pulse, its output voltage waveform cuts off the gated amplifier V202 to end the counting cycle. The V203 multivibrator negative gate at the start of each counting cycle, simultaneously triggers on the dither multivibrator and shuts off the COMPARATOR indicator I901 if it should be glowing.

5. FEMALE BOARD E301.

a. FUNCTION.—Two identical male boards constituting the fixed high-speed counter circuit, are located on female board E301. The high-speed counter circuit consists of two cascaded binary counter stages which count four 25-yard/cycle inputs for every 100-yard output pulse.

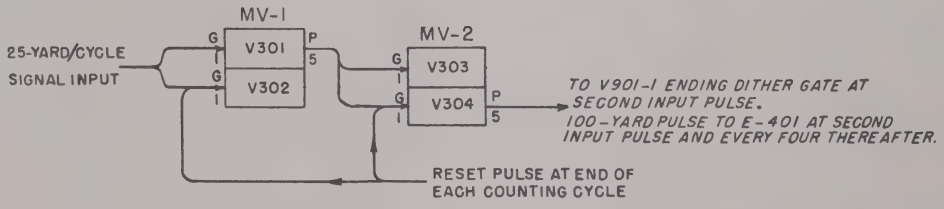
b. HIGH-SPEED COUNTER CIRCUIT.—Each binary counter stage consists of a bi-stable multivibrator circuit using two pentode tubes because of the relatively high counting frequency involved. The operation of these stages is quite critical, necessitating a separate variable cathode control for each binary to secure the most satisfactory operating conditions. Refer to paragraph 1*c* of this section for a discussion on binary counter operation.

EQUIPMENTS BEARING SERIAL NUMBERS 1 THROUGH 30.



COUNT	MV-1 V302	MV-1 V301	MV-2 V304	MV-2 V303
RESET	+	−	+	−
1	−	+	+	−
2	+	−	−	+
3	−	+	−	+
4	+	−	+	−
1	−	+	+	−
2	+	−	−	+

EQUIPMENTS BEARING SERIAL NUMBERS ABOVE 30.



COUNT	MV-1 V302	MV-1 V301	MV-2 V303	MV-2 V304
RESET	+	−	−	+
1	−	+	−	+
2	+	−	+	−
3	−	+	+	−
4	+	−	−	+
1	−	+	−	+
2	+	−	+	−

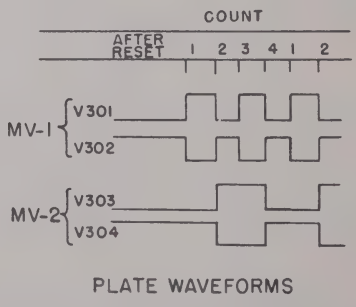


Figure 2-9. High-Speed Counter Operation

The input to the first binary counter, male board E302, is the negative half-cycle of the 25-yard/cycle signal, applied to the grids of V301 and V302 through germanium diodes CR301 and CR302, respectively. The first input signal stops conduction of V301, and starts V302 drawing current. The second input signal reverses these conditions, cutting off V302 and triggering V301 into conduction. This produces a negative pulse in the plate circuit of V301, which triggers the binary counter stage of E303. Control R310 on the female board E301 adjusts the cathode bias on tubes V301 and V302, for the correct count. Control R324 performs the same function for tubes V303 and V304 of the second binary counter on male board E303. The outputs of this stage are two differentiated square waves taken from the plate circuits of V303 and V304. The negative pulse output of V303 is the 100-yard output trigger of E301, and drives the 100-yards counter circuit of female board E401. The negative pulse output of V304 has effect only once for each counting cycle; after the second 25-yard/cycle input pulse it provides the negative pulse which triggers V901 to end the dither gate.

On *equipments which bear serial numbers above 30,* the output of E301 is a differentiated square wave taken from the plate circuit of V304. The negative pulse output of V304 is the 100-yard output trigger of E301. It drives the 100-yards counter circuit of female board E401, and for each counting cycle provides the negative pulse which triggers V901 to end the dither gate.

After coincidence, at the end of each counting cycle, the reset is applied through terminal P301-D to the grid circuits of V302 and of V304 (on E301). The reset pulse is negative, and pre-sets the multivibrators for the start of the next counting cycle, so that V302 and V304 are cut off and V301 and V303 conduct.

On *equipments bearing serial numbers 1 through 30,* when the reset pulse occurs and drives the plate of V303 negative, a negative output pulse is fed to the first binary stage of E401. However, this pulse has no effect since the reset pulse applied at the same time to the binary stages of E401 is wider and stronger.

On equipments bearing serial numbers above 30, however, the output which is taken from V304 is positive during reset and therefore has no effect on stage E402. A summarized description of the high-speed counter circuit is illustrated in figure 2-9. The fourth input (second for equipments with serial numbers above 30) to E301 and every fourth 25-yard/cycle input thereafter causes a 100-yard output pulse. The first pulse to the dither multivibrator, incident with the second 25-yard/cycle input at the start of the counting cycle, shuts off the dither multivibrator stage on male board E902.

6. FEMALE BOARDS E401, E501, E601.

a. GENERAL.—These three female boards are decade counters (see figure 2-3), each having four male boards. Except for a slightly different capacitance on the first board E402, it and the remaining eleven male boards are identical binary counter stages, and operate as previously described in paragraph 1*c* of this section. The input pulse to each decade counter is a negative trigger which advances that particular counter by one count, until the counting cycle is ended. Functionally, each of the three female boards will in turn divide its input trigger by ten, so that the output of E601 will be one 100,000-yard pulse for every thousand 100-yard input pulses received by E401.

b. COUNTING OPERATION.—Since the three female boards, 100-yards counter E401, 1000-yards counter E501, and 10,000-yards counter E601, are basically the same in operation, only E401 will be considered in the following discussion. The input pulse is negative and approximately 1.5 volts in amplitude. Assuming the E401 count to be at 0, in which condition all the A sections are off (non-conducting) and the four B sections are on (conducting), the first input pulse will turn the A section of V401 on and its B section off. Refer to figure 2-3. On the second input pulse (divider count of two), V401-A is turned off and V401-B turned on. In turning on V401-B, the negative gate in its plate circuit turns on V402-A. The third 100-yard input pulse turns V401-A on again. On the fourth input pulse V401-B is again turned on, and through C406 and CR405, turns on V402-B which then triggers V403-A on. The fifth input pulse turns V401-A on again, while the sixth input pulse turns it and V402-B off. The seventh pulse again turns V401-B off. However, on the count of eight, V401-B is turned on, and in successive order V402-B, V403-B, and

V404-A conduct. When this section of V404 conducts, a negative feedback pulse from V404-B is sent through C420 to V402-B, and through C421 to V403-B. This action turns on the A sections of V402 and V403, so that when the tenth input pulse arrives (count of ten), it will successively cause all the A sections to cut off and the B sections to conduct. The negative voltage gate produced in the plate circuit of V404 is differentiated, and the leading negative edge used to trigger the succeeding decade counter circuit of E501.

Thus, for ten input pulses to E401 there is one output pulse, and the circuit is returned to its original status to repeat the same sequence over and over again until the end of the counting cycle. In this manner E401 triggers E501 with one negative 1000-yard pulse for every ten 100-yard input pulses it receives from E301, E501 triggers E601 with one negative 10,000-yard pulse for every ten 1000-yard input pulses it receives from E401, and E601 triggers E701 with one negative 100,000-yard pulse for every ten 10,000-yard input pulses it receives from E501.

c. RESETTING.—Observe figure 2-3 and note, that for each one of the ten count conditions of a decade, there is a different combination of conducting and non-conducting triode sections. Hence, by pre-setting the four binary counters to one of these conditions, it is possible to start the counting cycle from any one of these ten counts. This is done by placing a large negative pulse, from the reset amplifier circuit after the counting cycle has been completed, on the grids of the tube sections desired to be cut off. For example, if the 100-yard selector dial S401 were set at 6, then the E401 counter must be pre-set to a count of three, for the start of each counting cycle. Six pulses would then complete the count to nine, for coincidence to occur. Reference to figure 2-3 indicates that the A sections of V403, V404 and the B sections of V401, V402 should be off. The negative reset pulse is therefore channeled to the grids of these tube sections through the contacts of S401 in the "6" position.

The selector dials S401, S501, S601, are connected so that the reset pulse can be applied to the proper binary grids, for pre-setting any count from zero to nine. Capacitors C428, C429, C526, C527, C626, and C627 provide d-c isolation between reset connections. Coupling between binary stages through the reset network is minimized by an isolation resistor placed in each reset lead.

d. COINCIDENCE OUTPUTS.—With the exception of V401, coincidence outputs for the three decade counters are taken from the B sections (plate pin 1) of the first and fourth binary counters. These are positive voltages of approximately four volts peak, simultaneously present only at the count of nine. The coincidence output of V401-1 is fed through terminal K of P/J401 to the coincidence mixer V802 suppressor grid circuit. The coincidence outputs of V501-1 and V504-1 are coupled together through resistors R503 and R506 on female board E501, and through terminal E of P/J501 combine with the coincidence voltage from J401-K. See figure 2-6. The coincidence outputs of V601-1 and V604-1 join through resistors R609 and R642 on female board E601, and through terminal E of P/J601 connect to the control grid of coincidence mixer V802.

Note that the voltage waveform at plate pin 1 of the fourth binary stage only swings positive at the count of eight, and remains at its upper level until the count of ten (zero). The voltage waveform at plate pin 1 of the first binary counter swings positive on every odd count, including the coincidence count of nine. However, to insure operation of the coincidence mixer V802 at the proper moment, an additional coincidence output is taken from the A section of the first binary stage of the 100-yards counter E401. This is a negative-going pulse taken off the plate pin 8 of V401, and coupled through terminal E of P/J401 to an amplifier-inverter stage V801 and thence to the control grid of coincidence mixer V802.

7. FEMALE BOARD E701.

Female board E701 includes four male boards. Two of these boards, E702 and E703, form the low-speed counter circuit, while the other two boards E704 and E705 form the reset circuit.

a. LOW-SPEED COUNTER CIRCUIT.—The two male boards of the low-speed counter circuit are identical to those used on the 1000-yards counter E501 and on the 10,000-yards counter E601. Each board is a binary counter which operates as previously described in paragraph 1*c* of this section. However, only two counter stages are used, so that the low-speed counter circuit has a counting capacity of four between terminal counts. The first stage V701 is triggered by the 100,000-yard negative output pulse of E601. When the plate pin 1 of V701-B swings negative, at the low-speed counter count of 0 or 2 (see figure 2-4), it triggers the second counter stage V702 on male board E702. When the plate pin 1 of V702-B swings negative, at the count of 0, it triggers the reset circuit through test switch S702 (in OPERATE position) to prepare the counter stages for the next counting cycle. The two binary counters of E701 are then reset through contacts of switch S701, which channels the negative reset pulse to the selected grids of V701 and V702.

The coincidence outputs of the low-speed counter circuit are positive voltage pulses of approximately 10 volts, and taken from the plate pin 1 circuits of V701 and V702. Plate pin 1 of V702 swings positive at the count of 2, and remains at its upper level until the end of the counting cycle. Plate pin 1 of V701 swings positive at the divider counts of 1 and 3, the latter count being coincidence for the low-speed counter. A positive voltage waveform of approximately 14 volts is then formed by the two plate waveforms developed through resistors R709 and R720. This combined waveform is fed through terminal E of P/J701, and joined with the 10,000-yards counter E601 coincidence output at the control grid of V802.

b. RESET CIRCUIT.—The two male boards E704 and E705 of the reset circuit on E701, include a multivibrator stage V703, and two twin-triode amplifiers V704 and V705. The reset multivibrator V703 on male board E704 is a monostable stage in which section 5-7-8 normally conducts and section 4-2-1 is cut off. The two cathodes are connected together, and current flowing through the common cathode resistor R727 cuts off the B section of the tube whose grid pin 2 is at ground potential through R729. However, when the negative drive pulse is applied to grid pin 7 of V703, through C708 and CR-705, it reduces tube conduction. This drops the voltage at the cathode side of R727, lowering the bias on section 4-2-1 until it is able to conduct. The resultant voltage drop at the plate pin 1 is coupled through C710 to grid pin 7 of V703 to cause cut-off of that section. This condition lasts only temporarily dependent upon the time constant of R727, R724, C710, and the circuit reverts to its stable condition. The positive pulse thus produced in the circuit of the plate pin 8 of V703 is coupled through C709 to the grids of the reset amplifier triode sections.

The purpose of CR-705 is to block the positive trailing edge of the differentiated negative gate output of the low-speed counter-board E702. This prevents the possibility of V703 being affected by the positive pulse after the negative leading edge triggers V703. The resistor R738 provides a discharge path for the capacitor C708 to prevent the build-up of any charge which would affect the tube operation, at high repetition rate.

On equipments bearing serial numbers 1 through 495 and 800 through 822, CR705 and R738 are not used. The differentiated negative gate output of the low-speed counter-board E702 is coupled directly to grid pin 7 of V703 through C708.

The reset amplifier tubes V704 and V705 on male board E705 are normally kept non-conducting. They have their control grids coupled in common to the same positive input pulse, and have their cathodes connected in common to a fixed d-c voltage (about 8 v.) at the junction of R735 and R736. When triggered, negative pulses of approximately 20 volts are produced in the plate circuits, each of which feeds a reset pulse simultaneously to different circuits in the equipment, as shown in figure 2-5.

Test switch S702 selects the source of the negative input pulse for the reset multivibrator V703, whose positive pulse triggers the reset amplifiers. This source may be either the negative gate of V702 pin 1 immediately after coincidence, or the negative edge of the square wave from V101 pin 8. When S702 is in OPERATE position, the reset circuit depends upon the functioning of all the counter circuits before it can receive its input pulse. In the TEST position of S702, the reset circuit is triggered by the trigger multivibrator V101 independently of the counting network, and after the counters have been permitted to function. Consequently, trouble-shooting the counters and other circuits of the units is facilitated by the use of switch S702 in TEST position.

8. FEMALE BOARD E801.

Female board E801 includes three male boards, two of which comprise the mixer-coincidence circuit and the third containing the comparator mixer stage.

a. MIXER-COINCIDENCE CIRCUIT.—This circuit comprises an amplifier stage V801 on male board E802, and a mixer stage V802 on male board E803. The amplifier stage V801 is of conventional design, receives a negative pulse input (about two volts, peak) through terminal A of P/J801 from pin 8 of V401, and provides a positive output pulse. This output is added to the voltage waveform received through terminal T of J/P801, and connected to the control grid pin 7 of the mixer tube V802. See figure 2-6.

The suppressor grid pin 5 of V802 receives through terminal D of P/J801, the combined coincidence output of female boards E401 and E501. The peak voltage of this positive waveform applied to the suppressor is controlled by potentiometer R808, and adjusted to about 46 volts. See figure 2-6. Normally the mixer tube V802 is biased to cut-off by the positive d-c voltage applied to its cathode from the junction of R810 and R811. Variable resistor R810 controls this bias on V802 for optimum operation of the stage. At coincidence, when the grid waveforms are at their maximum peak value, the cut-off bias is overcome and V802 conducts. However, the bias on the tube must be so adjusted that the tube will not conduct until the final count, when binary counter V401-B (tube section

4-2-1) cuts off at the E401 100-yards counter count of nine. The negative plate output of V802 is clipped, and through terminal M of P/J801 fed to the final coincidence amplifier stage V903.

b. COMPARATOR MIXER STAGE.—In effect, this stage V803 on male board E804 is similar to V802, in that the tube is kept cut off until all the required signals are impressed simultaneously on its two grids to overcome the bias. These required signals are the positive strobe received from T103-4, and the external pulse received from the COMP INPUT jack J802. The strobe is received through terminal E of J/P801 and applied to the suppressor grid pin 5 of V803. It is the standard signal, at a selected range, against which the external marker input is compared. The marker input signal, which may be of either polarity providing the POLARITY switch S801 is set to correspond, is applied across the SHARPNESS control R816. The arm of this potentiometer connects to the grid pin 7 of V803, and is adjusted so that the neon bulb I901 glows only at one setting of the range switches. Consequently, when the strobe positive pulse is applied simultaneously with the external marker pulse, tube V803 conducts. The negative pulse thus produced in the plate circuit, is fed through terminal S of P/J801, to trigger the multivibrator stage on male board E904.

9. FEMALE BOARD E901.

Three male boards are mounted on female board E901. Male boards E902 and E903 include the dither circuit and final coincidence amplifier stage. The comparator multivibrator stage V905 is on male board E904.

a. DITHER CIRCUIT.—This circuit includes a high-speed binary counter stage on male board E902, and an integrator stage, section 5-7-8 of V903, on E903. The second section of V903 is the final coincidence amplifier stage, and is described below in this paragraph. See figure 2-6.

The high-speed binary counter, using tubes V901 and V902, is almost identical to the high-speed counters used on female board E301. The chief difference is that the dither multivibrator has separate inputs for its triggering on and off. Normally V901 is kept cut off while V902 conducts. The initiating trigger is a negative pulse received from the gate multivibrator plate pin 1 of V203, and applied to pin 1 of V902 through J/P901-D, a differentiating network, and germanium diode CR902. This causes V902 to cut off, and V901 to conduct. The multivibrator is returned to its original status when the second 25-yard/cycle input signal, passed through the gated amplifier V202 (opened by V203), triggers the E301 high-speed circuit to send a negative "dither off" pulse to pin 1 of V901, through J/P901-A and germanium diode CR901. This stops V901 conduction and starts V902 conducting, as in the original condition.

The duration of the resultant positive gate in the plate circuit of V902 will then depend on the timing between the trigger from the gate multivibrator V203, and the second 25-yard/cycle signal. Since these signals are derived from sources which are not synchronized with each other, this difference may vary up to one cycle (25 yards), and at random. To offset this source of jitter, the positive plate output of V902 is fed to the dither integrator grid pin 7 of V903, through capacitor C903 and resistor R915. This causes the normally cut-off tube section V903-A to conduct momentarily, and charges the cathode capacitors C905 and C906. The charge is proportional to the width of the positive gate, and hence is a function of the time delay between the opening of gated amplifier V202 and the second 25-yard/cycle signal entering the gate. This variable voltage is applied as positive bias to the grid of the initial blocking oscillator section 5-7-8 of V104, causing it to fire earlier by an amount proportional to the time difference between the unsynchronized trigger source and the standard crystal oscillator. The variable capacitor permits adjustment for exact cancellation of jitter.

The second section of tube V903 on male board E903 receives, through terminal R of J/P901, the negative pulse output of the mixer stage V802. This is amplified and converted to a positive pulse with its leading edge sloped, due to the integrating action of the capacitance to ground, in the plate circuit. The positive pulse is combined with the dither bias output at pin 5 of V903, and together through terminal F of P/J901 fed to the grid circuit of the first blocking oscillator stage V104 on male board E104. The positive pulse riding on the dither bias level triggers the oscillator at the proper moment to eliminate jitter. A variable capacitor C906 on the chassis changes the slope of the pulse leading edge and the voltage of the integrator output to adjust the circuit for exact jitter cancellation.

b. COMPARATOR MULTIVIBRATOR. — Stage V905 on male board E904 is a bi-stable multivibrator with its A section normally cut off and B section conducting. This is due to the negative gate output of V203 pin 1, which is differentiated by C909-R923 and applied to grid pin 7 of V905 through germanium diode CR903. The negative pulse thus applied on the grid at the start of every counting cycle keeps the A

section of V905 cut off. However, when a negative pulse appears in the plate circuit of V803 and is coupled through terminal H of J/P901, differentiating network C913-R933, and germanium diode CR904 to grid pin 2 of V905, the B section is cut off and the A section conducts. Increase in voltage thus appearing at the plate pin 1 of V905, is coupled through terminal J of P/J901 to light the COMPARATOR indicator I901. This happens at the end of the counting cycle when the output of the final blocking oscillator is applied to the comparator mixer V803 simultaneously with the external marker pulse. The COMPARATOR indicator I901 is extinguished at the start of the next counting cycle when the negative pulse triggers grid pin 7 of V905. The indicator I901 therefore glows from the time of the output pulse to the next gate, which time is dependent upon the trigger repetition frequency. The repetition rate is high enough to make it appear to glow continuously when the comparator mixer V803 is producing a continuous output. The current through the COMPARATOR neon lamp I901 is limited by R929. Resistor R927 balances the load caused by the indicator lamp on the multivibrator.

c. SUMMARY.—The dither circuit eliminates the jitter that would result in the range strobe output because of the standard crystal oscillator output being independent of the trigger repetition frequency. It does this by measuring at the start of each counting cycle the time between opening of the gate circuit and the second 25-yard/cycle signal to pass through the gated amplifier. This time measure is converted to a variable bias voltage which hastens, by a corresponding period, the triggering of the initial block oscillator at the end of the counting cycle.

The comparator circuit lights an indicator lamp when an external marker pulse and the strobe output with which it is being compared, are in coincidence. If these two pulses applied to the grids of the mixer stage V803 are in coincidence, and of sufficient amplitude to overcome the cut-off bias, then a negative output is produced. This triggers a bi-stable multivibrator V905 which lights the COMPARATOR indicator, at the end of the counting cycle. The multivibrator is reset at the start of the next counting cycle, to turn off the indicator.

10. POWER SUPPLY AND MISCELLANEOUS CIRCUITS.

a. POWER SUPPLY CIRCUIT.—Input power is applied to the power transformer T1001 through fuses F1001 and F1002, filters Z1003 and Z1004, and the POWER switch S1001. Through S1001 the proper tap on the primary winding of T1001 is selected, so that the d-c output of the supply shall have a B+ potential of 130 volts. The POWER ON indicator I1001 through potentiometer R1001, indicates the proper tap selection. Initially R1001 is adjusted so that the POWER ON indicator I1001 glows when the secondary voltage of T1001 is at the value necessary to produce the proper value of B+ at the filter output.

The secondary winding 7-8 of T1001 connects across a selenium bridge rectifier CR1001, which converts the a. c. to pulsating d. c., and feeds it through a single pi-section filter composed of C1001 and L1001. The output voltage is 130 volts, with ripple less than one volt.

The secondary winding 9-10 of T1001 supplies 6.3 volts filament voltage for all the tubes in the equipment.

b. BLOWER ASSEMBLY.—The blower motor B1001 is d-c operated. The 115-volt a-c input power is fed through the two fuses S1001-B, and the thermostatic switch S1002, before being applied across the selenium bridge rectifier CR1002. The thermostat S1002 prevents the blower from operating until the equipment temperature reaches a minimum of 42°C (108°F). The rectified output is filtered by an RC filter (C1004, R1003, C1007), and fed through two interference filters (Z1001, Z1002) to the d-c motor B1001. The motor of this blower operates on a d-c supply of 90 volts, ±10%.

SECTION 3
INSTALLATION

1. UNPACKING.

CAUTION

The equipment is supplied with the chassis installed and all components in place. Avoid mechanical shocks when unpacking so that no inside or outside parts are damaged.

a. GENERAL.—Range Calibrator TS-573/UP is shipped in one wooden container measuring approximately 33 inches long, 21½ inches wide, 20½ inches high, and weighing about 130 pounds. Its set of operating spares is shipped in a separate container.

b. UNPACKING PROCEDURE.

(1) Clip the metal bands encircling the wooden shipping container, and remove.

(2) Remove the top of the box by taking out the nails. Use a nail puller for withdrawing the nails; never use a hammer or pinch bar for this purpose. Remove the excelsior on top of the unit, and tear open the waterproof paper.

(3) Lift the unit, in its corrugated container, out of the excelsior packed inside the wooden container.

(4) Open one end of this cardboard corrugated container, then tear open the moisture-vapor-proof barrier inside, to expose an inner corrugated container.

(5) Open the ends of the inner corrugated container, and remove the cardboard front, end, and back supports, while carefully sliding out the unit.

2. INSTALLATION.

Range Calibrator TS-573/UP is a portable test equipment not intended for any permanent installation. It may be located in any upright position that is convenient for the operator, providing the exhaust port in the rear is not covered and the unit is accessible to a suitable power source.

3. INITIAL ADJUSTMENTS.

a. GENERAL.—Range Calibrator TS-573/UP is adjusted at the factory for operation immediately upon delivery. However, it is advisable to make the following operational check and adjustment before releasing the unit for use. If any trouble is experienced, refer to the complete bench test and alignment procedure described in the Maintenance Section of this handbook.

b. PROCEDURE.

(1) Unlatch the four trunk locks on the unit, and remove the front cover. Unfasten the power cord mounted on the inside panel of the front cover, and mate its female connector with the recessed male receptacle in the lower right corner of the TS-573/UP control panel. Connect the other end to a 115-volt a-c power source.

(2) Turn on power. Do this by rotating the POWER switch (S1001) from its OFF position clockwise, one position at a time, until the red POWER ON indicator lights. Allow the equipment to warm up for about 20 minutes.

(3) Connect an output cable (use one of the three cables mounted on the front cover) from the SCOPE output jack (J106), to the external synch input connector of a test oscilloscope.

(4) Slide the unit chassis part way out of its dust cover, to expose the terminal board assemblies and their test-points jacks. Connect the oscilloscope input cable to TP203.

On the TS-573/UP front panel, set the REP RATE selector to 160, and the RANGE IN YARDS dials to 001100 yards. Adjust the oscilloscope sweep until a multivibrator gate voltage (see figure 5-4 sheet 1) is observed on the scope. Move the REP RATE switch to 480, adjust the scope sweep and observe three gate cycles on the scope; then to 800 and observe five cycles. Likewise check the gate output at TP203 with the REP RATE selector in the 1200 and 2400 positions.

(5) Connect the scope input cable to TP202. Adjust the scope sweep for aperiodic and, if possible, its sweep length to 4 or 5 μsec. Observe the 25-yard pulses to appear on the scope. Count the number of these pulses, and then move the scope input cable to TP301. Now observe half the number of pulses. Move the input cable to TP302, and note another division of pulses by two. If these patterns (see figure 5-4 sheet 1) are not observed, then adjust R310 for the first counter stage, and R324 for the second counter stage. The adjustment of these controls is critical, and should be made as described in paragraph 5*c* of Maintenance Section 5.

(6) Connect the scope input cable to the OUTPUT jack (J103). Adjust the OUTPUT AMPLITUDE and OUTPUT POLARITY controls to observe their action by the effect on the range strobe observed on the scope. Check the action of the range selector dials by observing uniform movements of the range strobe across the sweep trace, as each dial separately is varied through its entire range. Do this as follows,

each time adjusting the scope aperiodic sweep speed so that where possible, the range of a dial is covered on a single sweep setting.

(a) To check the 10's dial (S103), set the range yardage to 000100, and rotate the 10's dial from 0 through to 0.

(b) To check the 100's dial (S401), set the range yardage to 001000, and rotate the 100's dial from 0 through to 0.

(c) To check the 1,000's dial (S501), set the range yardage to 010000, and rotate the 1,000's dial from 0 through to 0.

(d) To check the 10,000's dial (S601), set the range yardage to 001000, and rotate the 10,000's dial from 0 through to 0.

(e) To check the 100,000's dial (S701), set the range yardage to 001000, and rotate the 100,000's dial from 0 through to 0.

(7) Connect the scope input lead to each of the OUTPUT TRIGGER jacks (J104, J105), and observe a trigger output pulse on the scope. The REP RATE selector should be set at one of the five internal triggering rates. Operate the TRIGGER polarity switch S102 to see that it inverts the output trigger.

(8) Remove the coaxial cable from the SCOPE jack (J106), and connect it from the OUTPUT jack (J103) to the COMPARATOR INPUT jack (J802) The red COMPARATOR indicator lamp should glow, showing that the TS-573/UP comparator circuit operates. In making this check, the OUTPUT POLARITY and COMPARATOR POLARITY switches should correspond to the same + or – selection.

(9) Slide the chassis back into its dust cover, and secure. This completes the unit operational check. If trouble is experienced refer to the Maintenance Section of this handbook.

NAVSHIPS 91760

WEIGHT:
CRATED 130 LBS.
UNCRATED 44-1/4 LBS.
CRATED DIMENSIONS:
LENGTH 33 IN.
WIDTH 31-1/2 IN.
HEIGHT 20-1/2 IN.
VACUUM TUBES:
24 JAN 6BF7 OR 6BF7W
4 JAN 5784
6 JAN 5840
1 JAN 5902
*46 DIODES, GE. CAT. NO. G5S3
HEAT DISSIPATION IN WATTS: 110
TO OPERATE IN AN AMBIENT TEMPERATURE RANGE OF -55°C. TO +65°C.
CUBIC CONTENTS
CRATED 9.3 CU. FT.
UNCRATED 2.1 CU. FT.
DIMENSIONS IN INCHES
*45 FOR EQUIPMENTS W/SERIAL NO.
1 THROUGH 495 AND 800
THROUGH 822

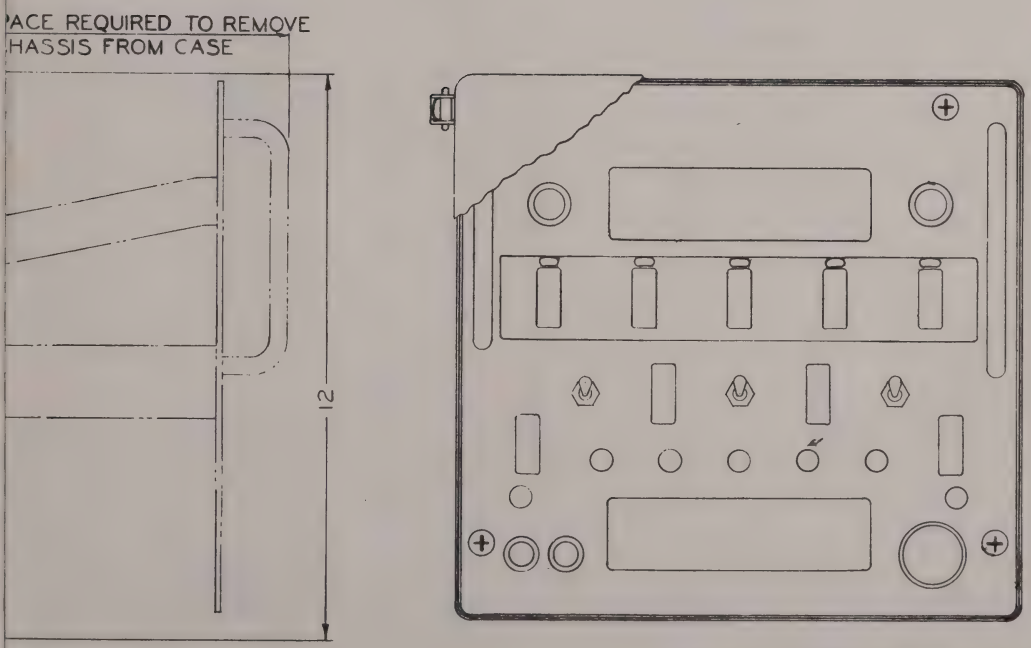


Figure 3-1. Outline Diagram, TS-573/UP

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each time adjusting the scope aperiodic sweep speed so that where possible, the range of a dial is covered on a single sweep setting.

(a) To check the 10's dial (S103), set the range yardage to 000100, and rotate the 10's dial from 0 through to 0.

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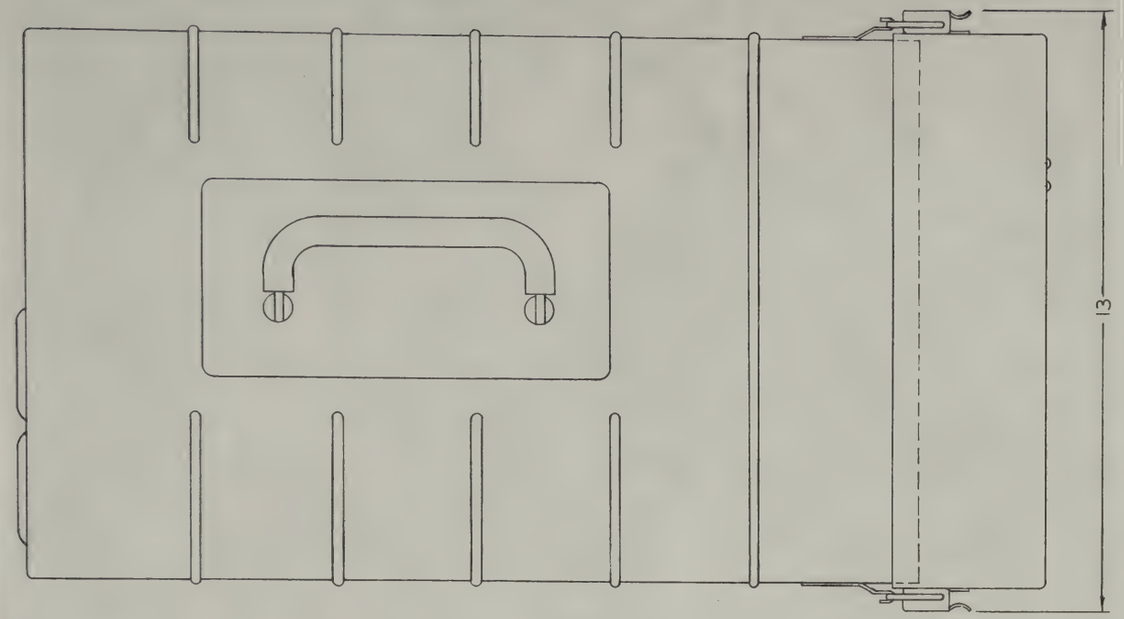
(8) Remove the coaxial cable from the SCOPE jack (J106), and connect it from the OUTPUT jack (J103) to the COMPARATOR INPUT jack (J802) The red COMPARATOR indicator lamp should glow, showing that the TS-573/UP comparator circuit operates. In making this check, the OUTPUT POLARITY and COMPARATOR POLARITY switches should correspond to the same + or – selection.

(9) Slide the chassis back into its dust cover, and secure. This completes the unit operational check. If trouble is experienced refer to the Maintenance Section of this handbook.



WEIGHT:
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UNCRATED 44-1/4 LBS.
CRATED DIMENSIONS:
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VACUUM TUBES:
24 JAN 6BF7 OR 6BF7W
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HEAT DISSIPATION IN WATTS: 110
TO OPERATE IN AN AMBIENT TEMPERATURE RANGE OF -55°C. TO +65°C.
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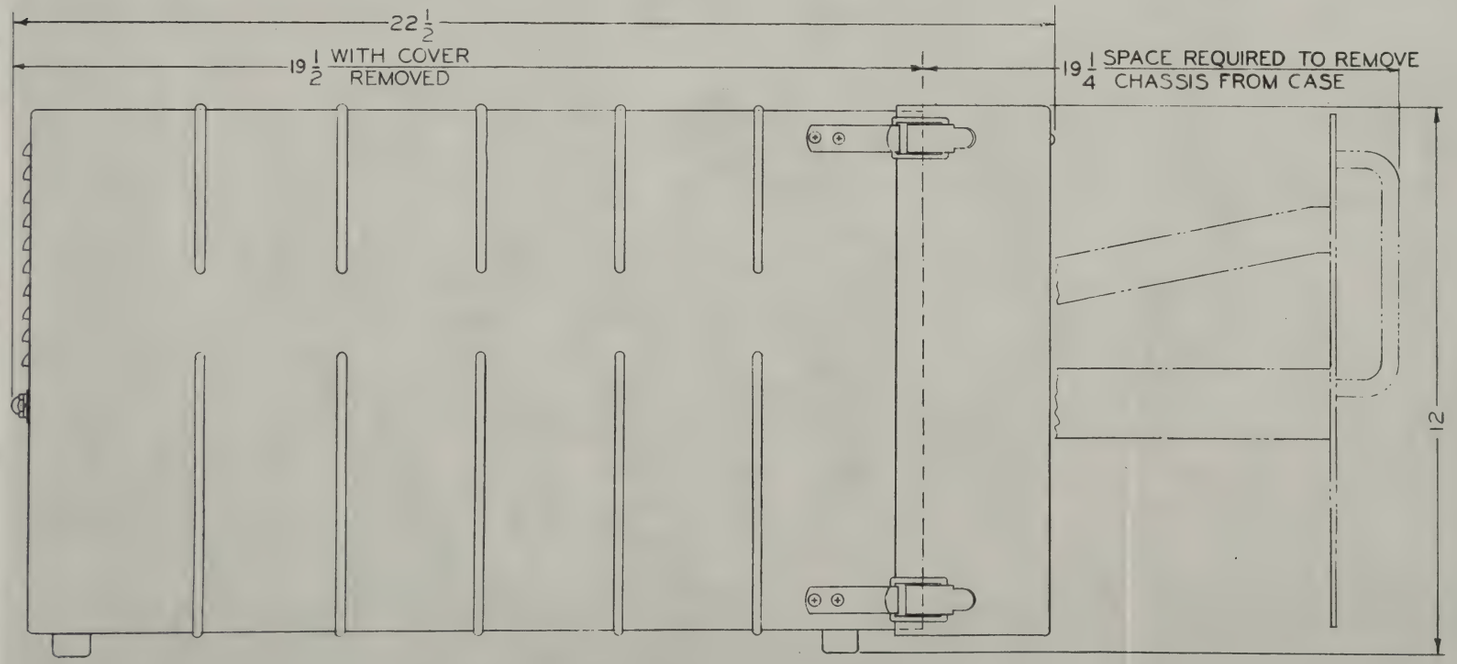


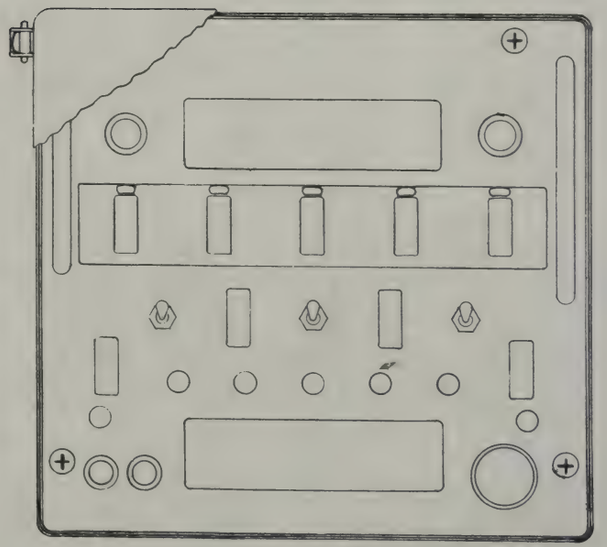


Figure 3-1. Outline Diagram, TS-573/UP

SECTION 4
OPERATION

1. GENERAL.

Range Calibrator TS-573/UP provides a precision range strobe output with which the range sweep circuits of a radar equipment may be calibrated.

NOTE

A strobe is a movable range marker whose position on the sweep of a radar time base may manually be adjusted to occur at any point.

Range Calibrator TS-573/UP may either be triggered by the radar equipment (external trigger operation) or triggers itself and the radar equipment (internal trigger operation). Range Calibrator TS-573/UP may also be used as a comparator with radar equipments that have their own marker generator, to indicate and adjust the range of the radar marker pulse. These procedures are described in the following paragraphs. Figure 4-1 is a front panel illustration showing the operating controls, and indicating their function in the tabulation below.

There are certain capabilities and limitations of Range Calibrator TS-573/UP. These are listed in paragraph 2 of this section. In paragraph 3 an operational check and adjustment procedure is given. This test takes but a few moments, and should be made before each use to insure the user that the Range Calibrator TS-573/UP is properly operating. Its strobe output then corresponds accurately to the range indication plus the calibrator zero error.

The calibrator "zero error" is a correction range figure inherent with each unit. It is a fixed error, and must be added to the RANGE IN YARDS indication of Range Calibrator TS-573/UP, to give the exact range in yards of the strobe output.

2. CAPABILITIES AND LIMITATIONS.

a. PULSE REPETITION FREQUENCY AND RANGE.—If the RANGE IN YARDS selection for the strobe output is made high enough on certain ranges of the REP RATE control S101, with test switch S702 in TEST position, the strobe will disappear. This is because the interval between resetting and the next trigger pulse has become less than the equivalent interval of the selected range. The counting circuits are then being reset before they reach coincidence. Figure 4-2 is a chart which indicates the maximum range that may be selected for the different repetition rates of the trigger pulse.

If the Range Calibrator TS-573/UP is being externally triggered and test switch S702 is in OPERATE position, the range strobe will be observed—but on a following sweep of the radar indicator. Consequently, the RANGE IN YARDS setting should never be greater than the maximum range shown in figure 4-2 on the OPERATE curve, for the repetition frequency of the radar trigger.

b. TEMPERATURE RANGE.—The components of this equipment are designed to give satisfactory service between the temperature ranges of –55°C (–67°F) and 60°C (140°F).

c. RADAR SET CHARACTERISTICS.—Range Calibrator TS-573/UP is capable of calibrating any radar equipment having the following characteristics:

(1) Pulse repetition frequency of from 47 to 5000 pulses per second, with up to ±10 percent jitter.

(2) Pulse widths from 0.1 to 6 microseconds, of 10-volt amplitude.

(3) Any type of presentation, such as PPI, A, B, etc., using sweep lengths from 1,000 to 400,000 yards.

(4) Automatic or manual tracking.

3. HOW TO OPERATE TS-573/UP FOR RANGE CALIBRATION, USING INTERNAL TRIGGER.

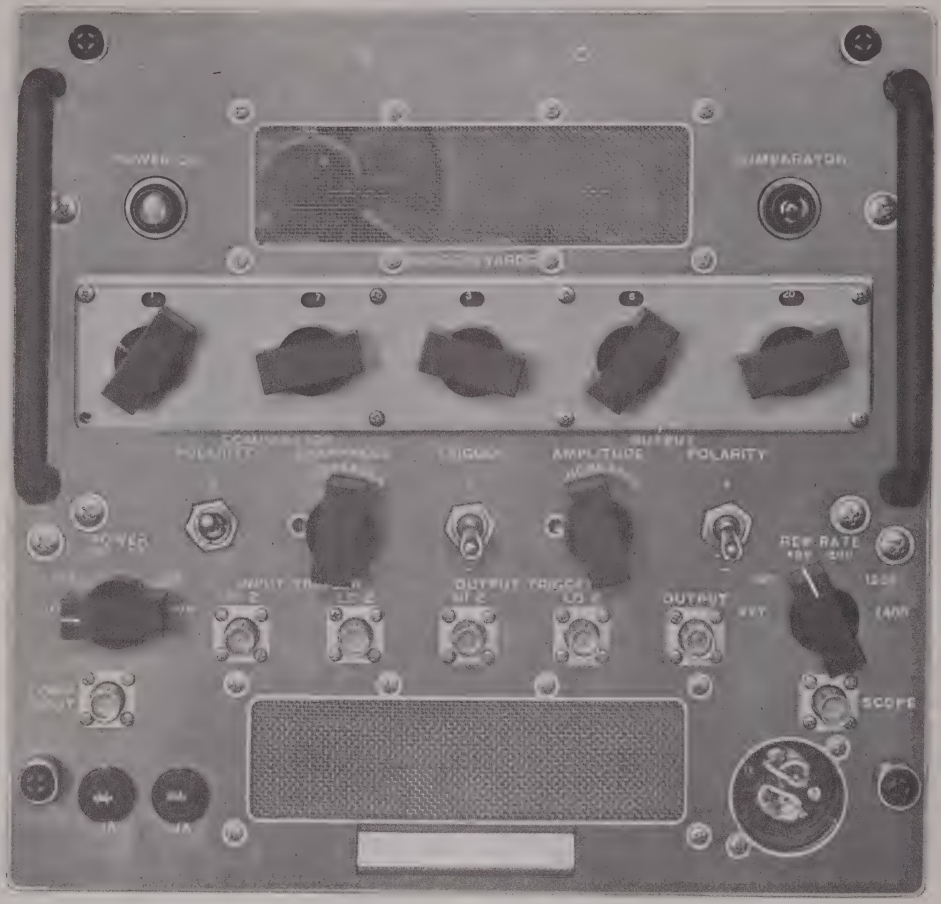
a. GENERAL.—In this method of operation, Range Calibrator TS-573/UP triggers itself and the circuit being calibrated in the radar equipment under test, at any one of five repetition rates. The strobe output of TS-573/UP connects to the video input of the circuit being calibrated, and may be of either positive or negative polarity. A negative synchronization output from the TS-573/UP is also available for triggering an oscilloscope or other supplementary test equipment.

The strobe appearing on the radar indicator will be separated from the triggering pulse by the RANGE IN YARDS selection of the TS-573/UP front panel dials, plus the calibrator zero error.

b. PROCEDURE.

(1) Connect power. Remove the power cord mounted on the front cover, and mate its female connector with the recessed male receptacle in the lower

394291 O - 56 - 3



CONTROL		FUNCTION
SYMBOL	DESIGNATION	
S1001	POWER	Turns power on. Adjust clockwise until POWER ON glows.
S101	REP RATE	Selects trigger source, and internal trigger repetition rate.
S102	TRIGGER	Selects output trigger polarity when in internal trigger use. Set to match input trigger polarity when in external trigger use.
	RANGE IN YARDS	Indicates yardage of range strobe.
S701	100,000-yd dial	Selects 100,000-yard intervals, from 0 to 3.
S601	10,000-yd dial	Selects 10,000-yard intervals, from 0 to 9.
S501	1000-yd dial	Selects 1000-yard intervals, from 0 to 9.
S401	100-yd dial	Selects 100-yard intervals, from 0 to 9.
S103	10-yd dial	Selects 10-yard intervals, from 0 to 9.
S104	OUTPUT POLARITY	Selects output polarity of range strobe.
R129	OUTPUT AMPLITUDE	Adjusts amplitude of range strobe output.
S801	COMPARATOR POLARITY	Set to match external marker input polarity at COMP. INPUT.
R816	COMPARATOR SHARPNESS	Sharpens external marker input for finer comparison and adjustment.

Figure 4-1. Range Calibrator TS-573/UP front panel operating controls and functions

right corner of the TS-573/UP control panel. Connect the other end to a 115-volt a-c power source.

(2) Turn on power. Rotate the POWER switch (S1001) from its OFF position clockwise, one position at a time, until the red POWER ON indicator lights. Allow the equipment to warm up for about 10 to 20 minutes before use, depending upon the ambient temperature.

(3) Interconnect the equipment. Remove two of the three coaxial cables mounted on the front cover. Connect one of these from the OUTPUT jack (J103) to the video input of the circuit being tested. Adjust the OUTPUT POLARITY switch (S104) for the required polarity.

Connect the second coaxial cable from either the HI Z or LO Z OUTPUT TRIGGER jack (J104 or J105), depending upon the input impedance of the circuit being triggered, to the trigger input connection of the circuit being calibrated. Connect any circuit under 5000 ohms impedance to the LO Z jack. The trigger amplitude is approximately 10 volts across an impedance formed by a 5000-ohm resistor shunted by a 1500-mmf capacitor. Adjust the TRIGGER switch (S102) for the required polarity.

Connect a third cable, if desired, from the SCOPE jack (J106) to either an oscilloscope or any other supplementary test equipment. This synchronizing signal is a negative trigger.

(4) Adjust TS-573/UP for the desired strobe yardage and pulse repetition frequency.

(a) Set the RANGE IN YARDS switch knobs for the desired strobe range, less the calibrator zero error. The selector on the extreme left indicates yards by 100,000-yard intervals, the next by 10,000-yard intervals, then 1000-yard intervals, 100-yard intervals, and finally on the extreme right side by 10-yard intervals.

(b) Adjust the REP RATE switch for the desired trigger pulse repetition frequency. This should be kept at a rate whose interval between pulses is longer than the time interval of the selected strobe range. Figure 4-2 illustrates the relationship between the trigger repetition frequency and the calibrator range in yards up to which the dials may safely be set.

4. HOW TO OPERATE TS-573/UP FOR RANGE CALIBRATION, USING EXTERNAL TRIGGER.

a. GENERAL.—In this method of operation, the internal triggering source of Range Calibrator TS-573/UP is made inoperative, and its circuits are triggered from an external source. This may be from the radar equipment triggering the circuit under test, and should be a pulse of at least 10 volts peak amplitude, either positive or negative. A positive output trigger at the same repetition rate as the external trigger, will then be available from the TS-573/UP. The strobe output of TS-573/UP connects to the video input of the circuit being calibrated, and may be of either negative or positive polarity.

The strobe appearing on the radar indicator will be separated from the triggering pulse by the RANGE IN YARDS selection of the TS-573/UP front panel dials, plus the calibrator zero error.

b. PROCEDURE.

(1) Connect power. Remove the power cord mounted on the front cover, and mate its female connector with the recessed male receptacle in the lower right corner of the TS-573/UP control panel. Connect the other end to a 115-volt a-c power source.

(2) Turn on power. Rotate the POWER switch (S1001) from its OFF position clockwise, one position at a time, until the POWER ON indicator lights. Allow the equipment to warm up for about 10 to 20 minutes before using.

(3) Interconnect the equipment. Remove two of the three coaxial cables mounted on the front cover. Connect one of these from the OUTPUT jack (J103) to the video input of the circuit being tested. Adjust the OUTPUT POLARITY switch (S104) for the required polarity.

Connect the second coaxial cable from the external triggering source to either the HI Z or LO Z INPUT TRIGGER jack (J101 or J102), depending upon the impedance of the external trigger pulse. If this impedance should be under 5000 ohms, then connect to the LO Z jack J102. Adjust the TRIGGER switch (S102) to the same polarity of the external triggering input.

(4) Adjust TS-573/UP for the desired range of the output strobe.

(a) Set the RANGE IN YARDS switch knobs for the desired range, less the calibrator zero error. The selector on the extreme left indicates by 100,000-yard intervals, down to the selector on the extreme right which indicates by 10-yard intervals.

(b) The repetition rate of the external triggering source may be set as desired (from 50 to 5000 pulses per second), providing its interval between pulses is longer than the time interval of the selected range. Figure 4-2 illustrates the relationship between the trigger repetition frequency and the calibrator range in yards up to which the dials may safely be set.

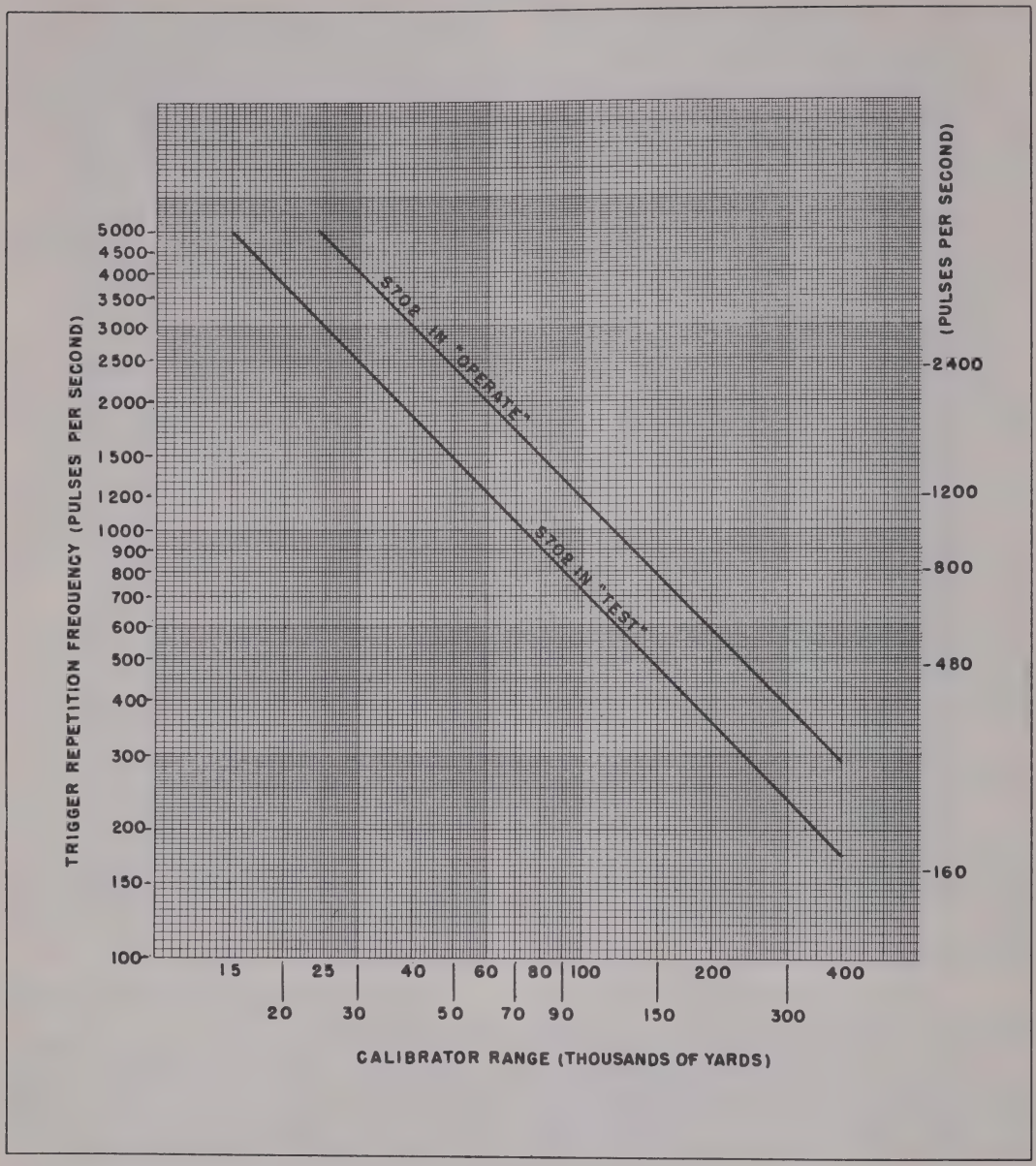


Figure 4-2. Maximum Range vs. Trigger Repetition Frequency

5. HOW TO USE THE COMPARATOR CIRCUIT OF TS-573/UP.

a. GENERAL.—In this method of operation, precision comparison of strobe and an external marker pulse may be made, and the range circuits of the equipment under test may be adjusted with precision. Either internal or external triggering of the TS-573/UP may be used. The marker pulse output of the equipment under test connects to a mixer stage in Range Calibrator TS-573/UP. The strobe signal feeds into this same mixer stage, and when the two are in coincidence the COMPARATOR indicator glows. To determine the range of the external marker, the strobe is varied until the indicator glows. The range is then equal to the calibrator zero error added to the range shown by the RANGE IN YARDS dial selectors. To adjust the external marker, the strobe is set to the desired range less the calibrator zero error by the RANGE IN YARDS dial selectors. The external marker control is then adjusted until the COMPARATOR glows.

b. PROCEDURE.

(1) Connect power. Remove the power cord mounted on the front cover, and mate its female connector with the recessed male receptacle in the lower right corner of the TS-573/UP control panel. Connect the other end to a 115-volt a-c power source.

(2) Turn on power. Rotate the POWER switch (S1001) from its OFF position clockwise, one position at a time, until the red POWER ON indicator lights. Allow the equipment to warm up for about 10 to 20 minutes before using.

(3) Interconnect the equipment. Remove two of the three coaxial cables mounted on the front cover. Connect one of these from the COMP INPUT jack (J802) to the marker output of the equipment being tested. Adjust the COMPARATOR POLARITY switch (S801) to the same polarity as the marker input pulse. The pulse should have an amplitude of about one volt.

Connect the second coaxial cable, if external triggering is to be used, from the external triggering source to either the LO Z or HI Z INPUT TRIGGER jack (J102 or J101). If the TS-573/UP internal trigger is to be used, connect the cable from either the LO Z or HI Z OUTPUT TRIGGER jack (J105 or J104) to the trigger input connection of the circuit being tested. In either case adjust the TRIGGER switch (S102) to the corresponding polarity of the trigger pulse present or required.

(4) Adjust the trigger repetition frequency.

(5) Rotate the COMPARATOR SHARPNESS control to its maximum counter-clockwise rotation.

(6) Adjust the five RANGE IN YARDS dial selectors until the COMPARATOR indicator glows.

(7) Rotate the COMPARATOR SHARPNESS control clockwise until the light is extinguished. Adjust the dial selectors until the lamp goes on again. Continue repeating this procedure until the COMPARATOR indicator remains on for only one setting of the switches. This is the exact range in yards of the external marker pulse less the calibrator zero error.

(8) To set the marker at a desired range, first pre-set the strobe by adjusting the RANGE IN YARDS dial selectors to this desired range minus the calibrator zero error. Rotate the COMPARATOR SHARPNESS control to its maximum counter-clockwise rotation, and then adjust the marker frequency control of the external marker until the COMPARATOR indicator glows. Advance the COMPARATOR SHARPNESS control clockwise, to peak the adjustment of the external marker.

FAILURE REPORTS

A FAILURE REPORT must be filled out for the failure of any part of the equipment whether caused by defective or worn parts, improper operation, or external influences. It should be made on Failure Report, form DD787, which has been designed to simplify this requirement. The card must be filled out and forwarded to BUSHIPS. Full instructions are to be found on each card.

Use great care in filling the card out to make certain it carries adequate information. For example under "Circuit Symbol" use the proper circuit identification taken from the schematic drawings, such as T-803, in the case of a transformer, or R-207, for a resistor. Do not substitute brevity for clarity. Use the back of the card to completely describe the cause of failure and attach an extra piece of paper if necessary.

The purpose of this report is to inform BUSHIPS of the cause and rate of failures. The information is used by the Bureau in the design of future equipment and in the maintenance of adequate supplies to keep the present equipment going. The cards you send in, together with those from hundreds of other ships, furnish a store of information permitting the Bureau to keep in touch with the performance of the equipment of your ship and all other ships of the Navy.

This report is not a requisition. You must request the replacement of parts through your Officer-in-Charge in the usual manner.

Make certain you have a supply of Failure Report cards and envelopes on board. They may be obtained from the nearest District Printing and Publication Office.

SECTION 5
MAINTENANCE

1. ROUTINE MAINTENANCE CHECK CHART.

Since Range Calibrator TS-573/UP is intermittently used test equipment, and is given a functional operational check before each use as part of the operating procedure, no routine maintenance check chart is required. However, the unit should be kept clean, dust-free, and handled with care.

2. LUBRICATION.

No lubrication of Range Calibrator TS-573/UP is ever required, excepting an occasional application of lubricant for ball and roller bearings Navy spec 14L3 to the case railing when the chassis does not readily slide in and out. The bearings of blower motor B1001 are permanently lubricated.

3. EMERGENCY MAINTENANCE.

a. NOTICE TO OPERATORS.—Operators shall not perform any of the following emergency maintenance procedures without proper authorization.

b. REPLACEMENT OF TUBES AND FUSES.—There are no tubes in the Range Calibrator TS-573/UP which may be readily replaced by an operator. There are two line-power three-ampere fuses on the lower left-side of the front panel which may be replaced in case of the power cutting off. See figure 4-1. Never replace either fuse with one of higher rating unless continued operation is more important than the probable damage. If a fuse burns out immediately after replacement, do not replace it a second time until the cause has been corrected.

4. TROUBLE SHOOTING INFORMATION.

a. METHODS OF LOCATION.—The design of the Range Calibrator TS-573/UP facilitates localization of trouble. All circuit assemblies excepting the power supply, ventilating system, and a few large components, are of plug-in type construction on individual male and female boards. Stage circuits are assembled on the thirty male boards, which mount on the nine female boards. Very few circuit components are assembled on the female boards, but these boards do include the variable controls and 28 test-point jacks. This provides for rapid analysis of the circuits by waveform comparison. By progressively comparing the obtained waveforms with the illustrated typical waveforms until a discrepancy is observed, the trouble may rapidly be localized to a stage. The stage under suspicion of being defective may then either be replaced by a male board from stock spares, or may be interchanged with an identical stage known to be good.

If replacement of a male board corrects the trouble, the defective male board may then be circuit-checked, analyzed, and repaired. If replacement of the male board does not correct the trouble, then the circuits should be further analyzed. Check operating voltages. Circuit check the female board and, if necessary, replace it. Circuit check the main chassis wiring for an open, shorted, or grounded wire.

A complete bench test and alignment procedure using the scope-comparison method of localizing trouble to a male board, is given in the following paragraph 5. This procedure progressively checks the circuitry stage-by-stage, and should be followed through from start to finish whenever trouble-shooting the equipment. Alignment procedures are described as they occur, and may be skipped if that particular stage is in good operating condition.

b. DATA PROVIDED.—To assist in trouble-shooting the equipment, refer to the servicing block diagram figure 5-37, the schematic diagram 5-38, and the wiring diagrams figures 5-14 through 5-36. The simplified diagrams figures 2-1 through 2-9 may help in understanding operation of the circuits and their analysis. However, when trouble-shooting with the test scope, refer to the typical waveforms illustrated in figures 5-4 sheets 1 through 4, and to the servicing block diagram figure 5-37. Use the schematic diagram, and voltage layout diagrams 5-5 through 5-13 for detailed analysis and voltage checking at pertinent points. The wiring diagrams will come in handy when circuit-checking for continuity, an open, a short, or a grounded connection.

Circuit-checking data for separate testing of the male and female boards, may be gathered directly from the schematic diagram. More information on unit testing is given in paragraph 6 of this section.

No trouble-shooting charts are included, since the given procedure on localizing trouble can rapidly track down trouble, and sufficient data is then provided to isolate the specific cause of trouble.

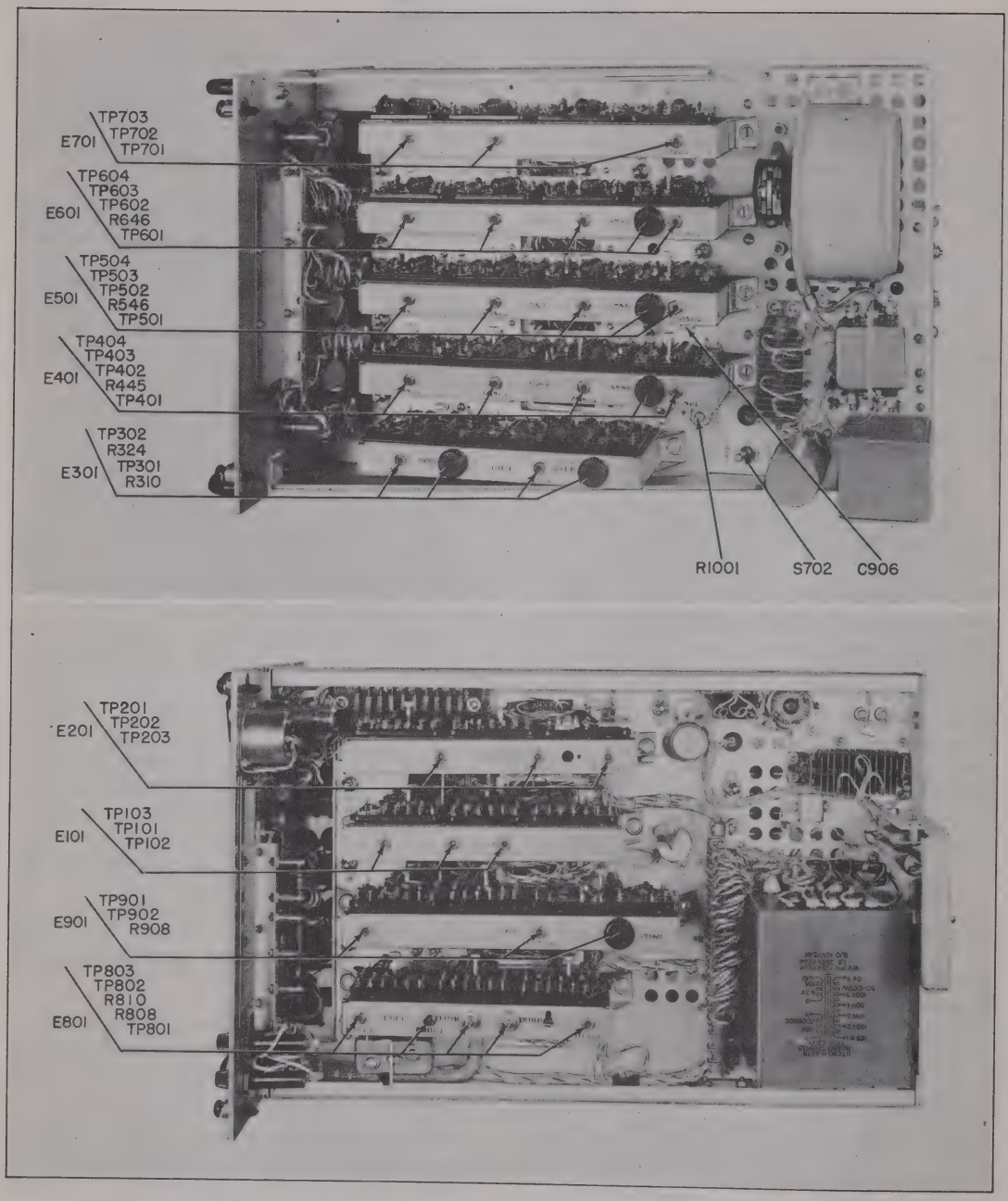


Figure 5-2. Top and Bottom Chassis Views

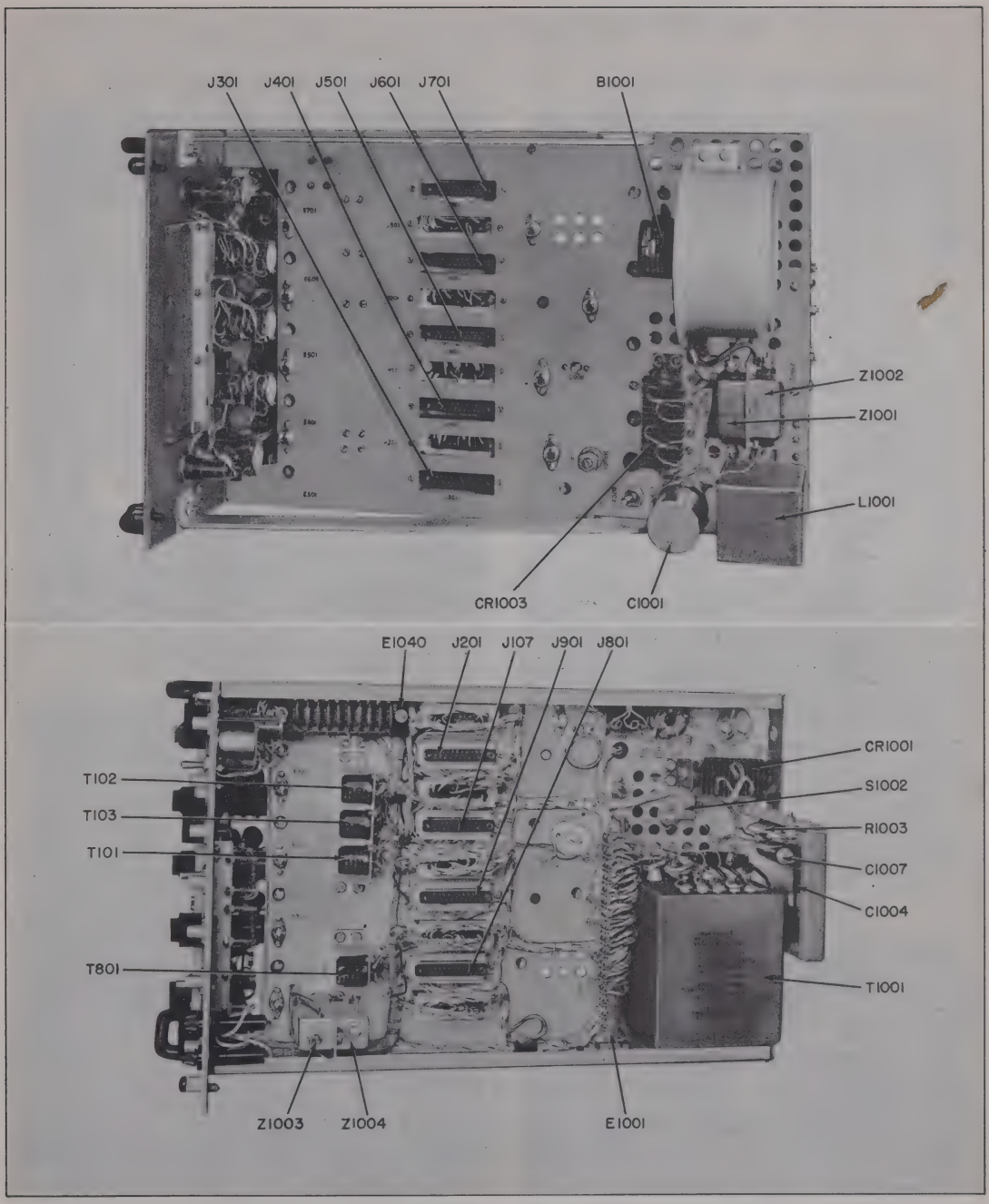
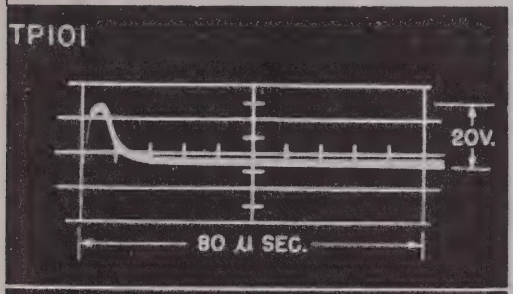
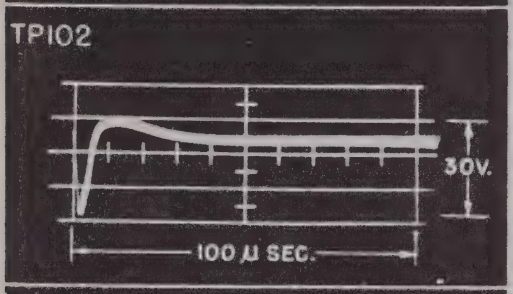


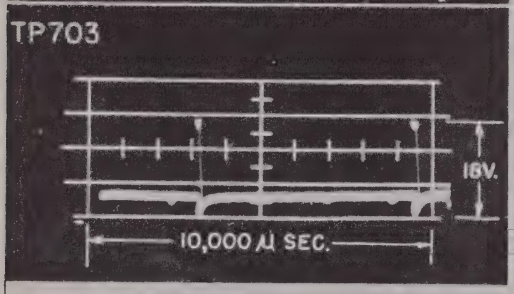
Figure 5-3. Top and Bottom Chassis Views, Sub-Assemblies removed

Test Conditions: S702 in TEST.
REP RATE at 160.
External synch to test scope from J106, aperiodic sweep.

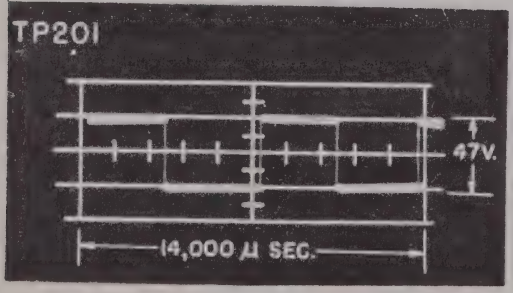
TRIGGER CIRCUITS



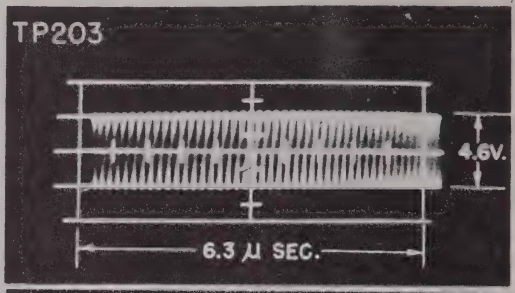


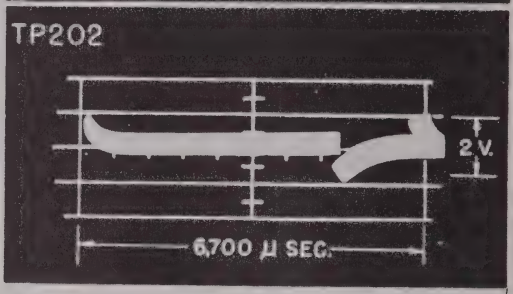


MULTIVIBRATOR

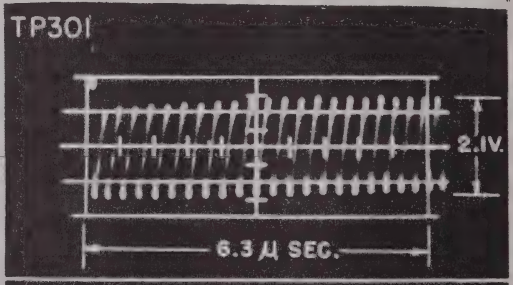


CRYSTAL OSCILLATOR





HIGH-SPEED COUNTER



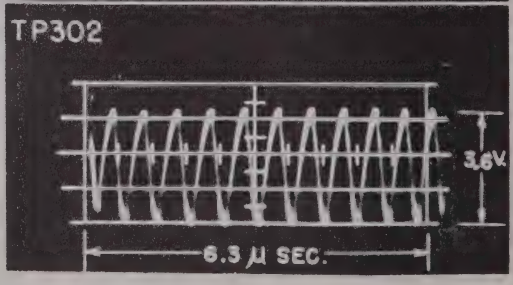


Figure 5-4. Typical Test Waveforms, Sheet 1 of 4

5. BENCH TEST AND ALIGNMENT PROCEDURE.

a. GENERAL.—In the following test and alignment procedure, Range Calibrator TS-573/UP is given a complete functional check using a test scope. Instructions for the alignment of chassis controls are included. If the Range Calibrator TS-573/UP should become inoperative, jittery, or intermittent, by following this progressive procedure the trouble may rapidly be localized, usually to a male circuit board. The defective terminal board may then be replaced by an interchangeable spare provided with the stock spares, and the procedure continued to check out the equipment as being normal once again.

This system of trouble-shooting and repair involves the use of only a scope in tracing through the signal circuits. However, before definitely attributing trouble to a specific board, check the suspected circuit through the various switches and connectors for continuity or a short. Also check that B+ and other operating voltages are being supplied. The B+ voltage of 130 volts is present at all terminal W's on the chassis-to-female 21-pin connectors. Removal of a male board opens all parallel paths on the male board.

b. TRIGGER CIRCUITS.

(1) If any sort of strobe output can be obtained with the REP RATE selector S101 in each and every one of the five internal trigger positions, then the internal trigger multivibrator stage E102 can be considered operating satisfactorily. Otherwise, check its operation as follows:

Connect the test probe of an oscilloscope to the SCOPE jack J106 on the TS-573/UP front panel. Set the REP RATE selector S101 to 160. Adjust the test scope for internal synch, and set its horizontal sawtooth sweep around 160 cps to obtain a pattern on the scope of the E102 stage output. Set the REP RATE switch S101 to 480, and observe three square waves on the scope. Check the 800, 1200, and 2400 positions of S101, in like manner. If the trigger multivibrator goes dead in any one of these five selections, check circuit continuity.

(2) Check the stages on male board E103, as follows:

Set the test scope for internal synch, and adjust the scope horizontal sweep to the internal trigger selection of the REP RATE switch S101. Connect the scope input to TP101, to TP102, then to the SCOPE jack J106, and observe the proper waveforms. Connect the scope input to the OUTPUT TRIGGER jacks J104 and J105, and observe a trigger pulse corresponding in polarity to the position of the TRIGGER selector S102. Make this check with S102 in the – (negative) position, and then in the + (positive) position.

(3) Check the reset multivibrator stage on E704, as follows:

Place the switch S702, mounted on the top surface at the right rear corner of the chassis, in its TEST position. Set the REP RATE selector S101 to 160, and connect the scope input to TP703. Set the test scope for internal synch, and adjust the scope horizontal sweep around 160 for a stable pattern. This should appear as in figure 5-4 sheet 1.

(4) Move the scope input to TP203, and observe the pattern shown in figure 5-4 sheet 1. This checks the gate multivibrator stage on E204, and the reset amplifier stage of E705 through which the reset pulse triggers V203.

c. CRYSTAL OSCILLATOR AND HI-SPEED COUNTERS.

(1) To check output of the crystal oscillator stage on E202, connect the test scope input to TP201. Set the scope in external synch, aperiodic sweep, and trigger it from the SCOPE jack J106. Adjust the scope sweep speed to its fastest sweep, and note oscillations to appear on the screen. Figure 5-4 sheet 1 illustrates a typical pattern. The 25-yard oscillations of V201 correspond to approximately 0.16 microsecond.

Trimmer capacitor C202 on male board E202 is factory-adjusted, and should not be re-adjusted unless the crystal is changed. This procedure is described in paragraph 6*a*(6).

(2) Connect the test scope to TP202. Observe a waveform pattern similar to the one in figure 5-4 sheet 1. This checks male board E203. The oscillator output amplitude control L201 may now be adjusted for maximum output on the scope.

(3) Without changing any other connections, move the test scope probe to TP301. On the scope note half the number of pulses as observed at TP202.

This checks the binary counter stage of board E302.

Check E303, by moving the scope lead to TP302 and again observing half as many pulses. Two controls (R310 and R324) on female board E301 adjust the count of these high-speed counter stages. Their adjustment is rather critical, and should be made as follows:

While observing the proper waveform output on the scope, rotate the control (R310 or R324, with scope correspondingly connected to TP301 or TP302) clockwise until the counter operation changes or otherwise becomes unstable. Mark the position of the control, then rotate it counter-clockwise until the same thing happens. Half-way in this zone of normal counter

DECADE COUNTERS

Test Conditions: S702 in TEST; REP RATE at 160; External synch to test scope from J106, aperiodic sweep. All voltages are peak.

E401	E501	E601
Range: 001000	Range: 012000	Range: 021000
Sweep: 13µs	Sweep: 140µs	Sweep: 1200µs

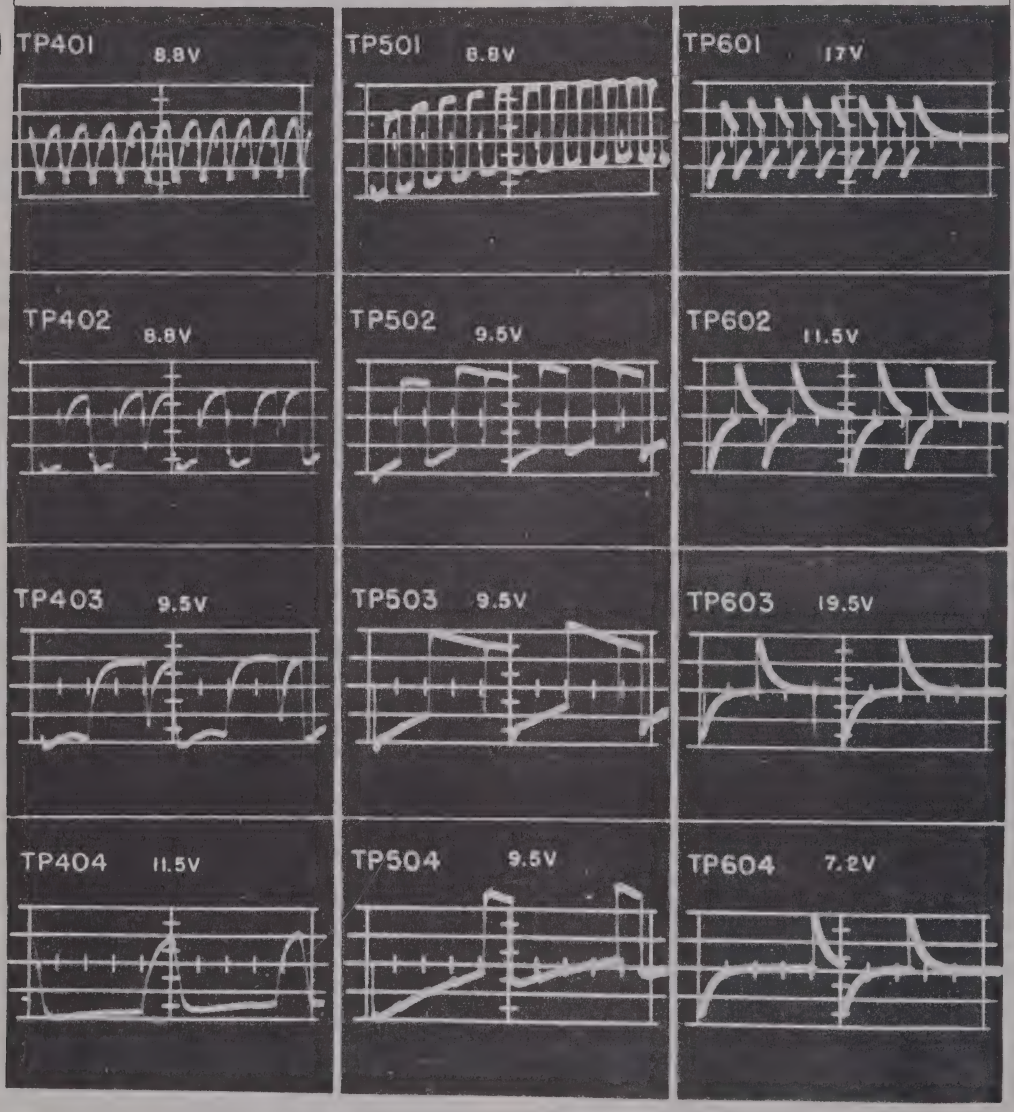
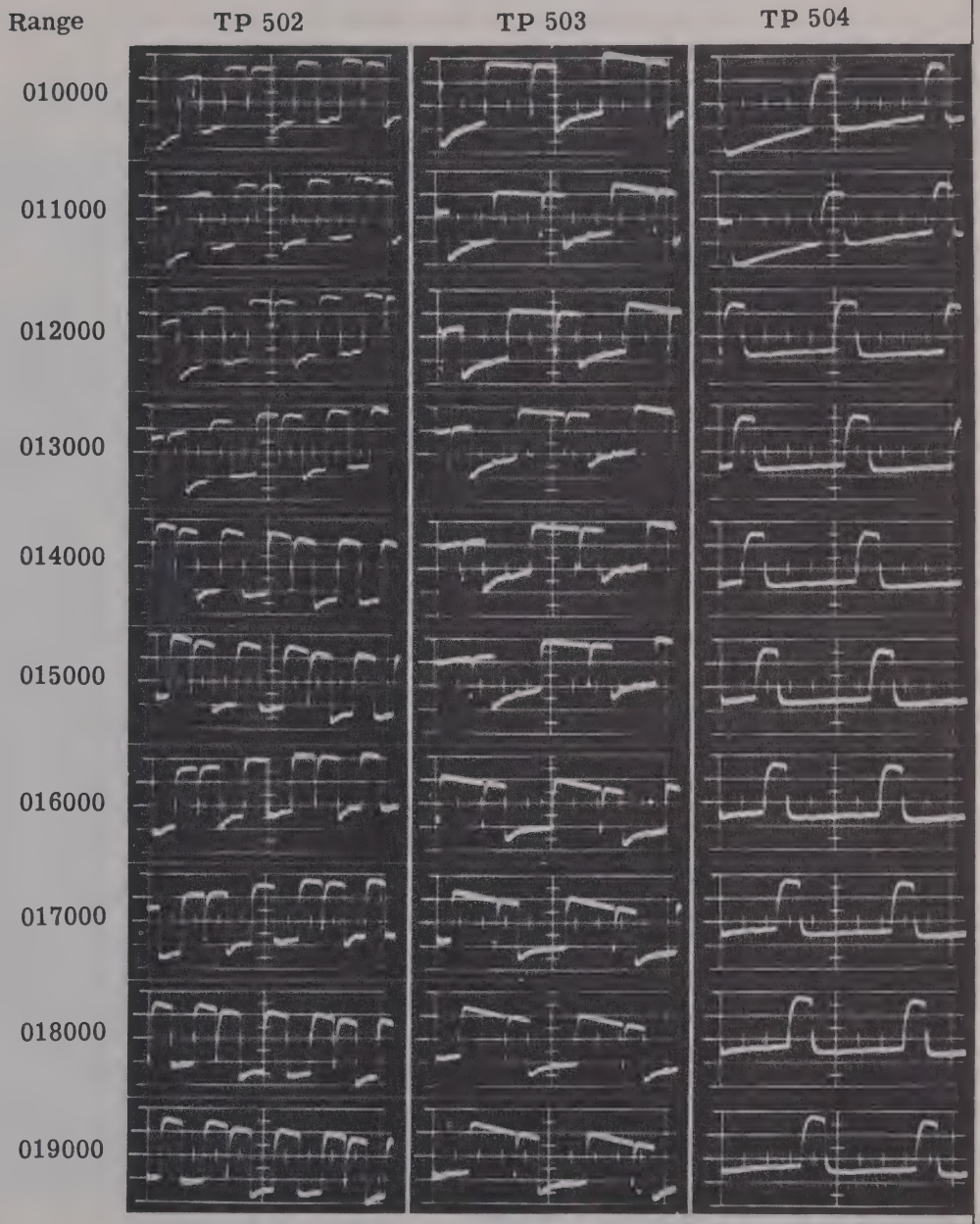


Figure 5-4. Typical Test Waveforms, Sheet 2 of 4

Test Conditions: S702 in TEST; REP RATE at 160; External synch to test scope from J106, aperiodic sweep 140 μsec.

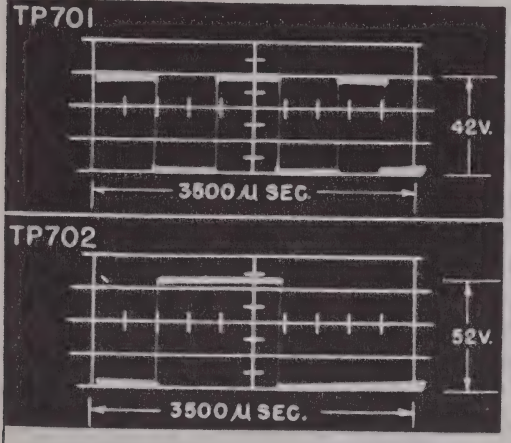


NOTE: Similar waveforms may be observed on E401, E601 decades at corresponding test points as range dial is varied 0 thru 9

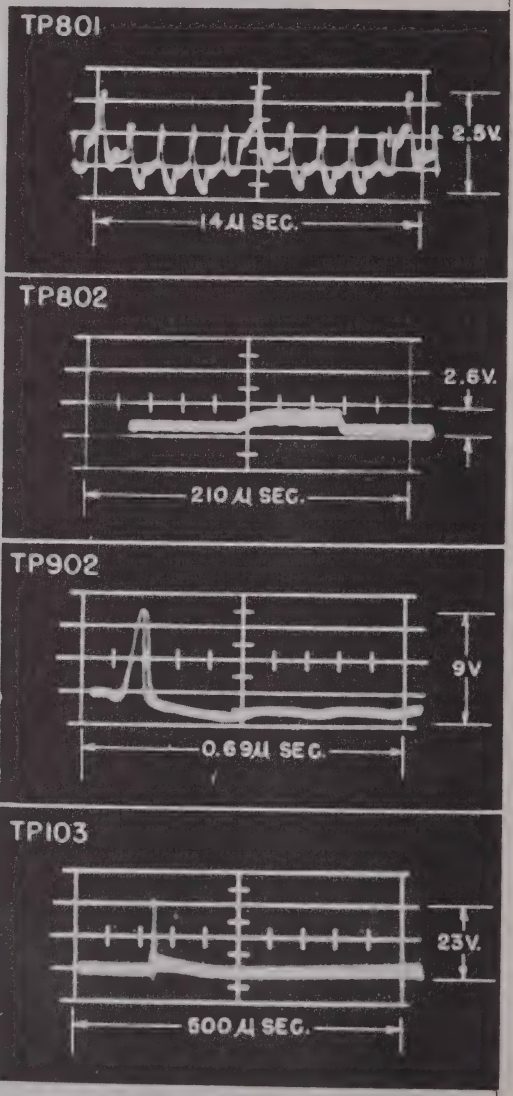
Figure 5-4. Typical Test Waveforms, Sheet 3 of 4

Test Conditions: S702 in TEST
REP RATE at 160
External synch to test scope from J106, aperiodic sweep.

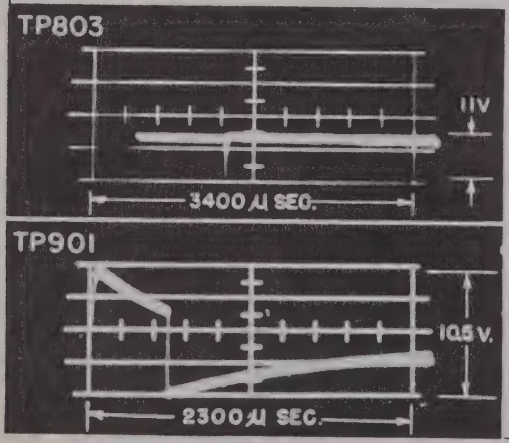
LOW-SPEED COUNTER



*COINCIDENCE-DITHER CIRCUITS



COMPARATOR CIRCUIT
(J103 to J802; S702 in OPER)



*Set S702 to OPER

Figure 5-4. Typical Test Waveforms, Sheet 4 of 4

operation is where the control should finally be set. Make certain that the frequency division is only two for each stage. It is possible for the high-speed counters to be incorrectly set and yet appear stable.

d. DECADE AND LO-SPEED COUNTERS.

(1) GENERAL.—Female boards E401, E501, E601, operate in identical fashion. Male boards E403 through E405, E502 through E505, E602 through E605, E702 and E703, are all identical and interchangeable. Reset pulses are applied to all these stages from four separate tube triodes on male board E705, through the dial selector switches. If trouble is experienced in the following procedure, and interchanging male boards does not help, continuity check the circuit making reference to the reset diagram of figure 2-5.

(2) DECADE COUNTERS.—Permit the chassis switch S702 to remain in the TEST position, the REP RATE selector S101 set to 160, the test scope in aperiodic sweep and synchronized externally from the SCOPE output jack J106. Adjust the RANGE IN YARDS dial selectors to 001,000 yards, and the scope sweep speed to 15 microseconds (not less than 2000 yards). Connect the scope input probe to TP401. Observe the waveforms on the scope, and compare them with those shown in figure 5-4 sheet 2, as the 100-yards dial S401 is switched from its present position of 0 through the nine other settings and back to 0. This checks male board E402.

Connect the scope input probe to TP402. Again switch the 100-yards dial S401 clockwise from 0 through to 0, comparing the observed waveforms with those illustrated in figure 5-4 sheet 2. This checks male board E403, and automatically indicates male boards E404 and E405 are properly operating. Repeat the same test with the scope connected to TP403, then TP404, while comparing waveforms with figure 5-4 sheet 2, only if the test of E403 indicated trouble. If the test at TP402 proved normal, then female board E401 and its male boards can be considered trouble-free and the tests at TP403 and TP404 omitted.

Check the decade counters E501 and E601, in similar manner. For decade counter E501, set the RANGE IN YARDS selection to 010,000 yards, the scope sweep to 20,000 yards (not less than 120 microseconds), and vary the 1000-yards dial S501 clockwise one revolution from 0 through to 0. For decade counter E601, set the RANGE IN YARDS selection to 100,000 yards, the scope sweep to 200,000 yards (not less than 1200 microseconds), and vary the 10,000-yards dial S601 clockwise from 0 through to 0. In each case, the waveforms observed at the four test-points should be similar to those illustrated in figure 5-4 sheet 2. Here again, if the waveforms at the second binary stage test-point (TP502, TP602) check normal, the entire decade counter is properly operating.

If the operation of a decade counter does not appear to be stable, its control (R445, R546, or R646 as the case may be) may be re-adjusted as follows: While observing the normal pattern on the scope, rotate the control counter-clockwise until the decade operation becomes unstable. Then back up the control about 10 to 15 degrees until the operation is again stable. Stable operation of a decade counter usually occurs over approximately 60 degrees of the control, with the best setting for continued stable operation near the clockwise edge rather than the center.

(3) LOW-SPEED COUNTER.—With the chassis switch S702 still in TEST position, the REP RATE selector S101 set to 160, the test scope in aperiodic sweep and synchronized externally from the SCOPE output jack J106, set the scope sweep speed to 2000 microseconds. Adjust the RANGE IN YARDS dial selectors to 001,000 yards. Connect the scope input probe to TP701, then to TP702, while observing the waveforms as the 100,000-yards dial S701 is varied clockwise from 0 through to 300,000. Compare the observed waveforms with those illustrated in figure 5-4 sheet 4.

e. COINCIDENCE AND DITHER CIRCUITS.

(1) COINCIDENCE CIRCUIT.—Set the chassis switch S702 in its normal operating position. Let the REP RATE selector S101 remain set at 160, the test scope in aperiodic sweep and synchronized externally from the SCOPE output jack J106. Set the strobe at any convenient range over 100,000 yards, and connect the scope input probe to TP801. Compare the observed waveform with that illustrated in figure 5-4 sheet 4. This checks one multiple-input to the coincidence mixer stage on E803. The other multiple-input comes from E601 and E701, and from E402 through an amplifier stage on E802, and can only be checked if an output appears at TP802. Connect the scope to TP802 and compare that waveform with the one shown in figure 5-4 sheet 4.

Adjust the two controls R808 and R810 as follows:

(a) Turn R808 all the way counter-clockwise, to its minimum value of voltage at the arm.

(b) Turn R810 all the way counter-clockwise, then advance it clockwise until an output waveform appears at TP802. This is due to screen grid conduction through the cathode circuit.

(c) Set the 100-yards switch S401 to 9. Connect the scope to the test-point TP103. No output pulse should be present. Advance R808 clockwise until an

output pulse does appear. Mark this point, and then continue rotating the control forward until the pulse on the scope becomes jittery and jumps ahead. Set R808 half-way between this point and the point previously marked.

(d) Check this adjustment of R808 and R810 by testing the pulse output at TP103 for stability, as the range selectors are one-by-one rotated through all of their positions.

If the pulse should disappear in any of these range settings, advance R810 to increase circuit sensitivity. Re-check all other range selections.

If the pulse doesn't uniformly jump as the range is increased and all counters are known to be operating correctly, turn back R810 to decrease circuit sensitivity. Re-check all other range selections.

(2) DITHER CIRCUIT.—Connect the scope input probe to TP901, leaving all other settings and connections as in the previous paragraph. Compare the dither multivibrator waveform to the typical waveform in figure 5-4 sheet 4. If necessary, adjust control R908 for stability of the circuit.

Now connect the scope to TP103. Adjust C906 until the jitter on the scope waveform is at a minimum.

(3) Connect the scope to the OUTPUT jack J103. Check operation of the OUTPUT POLARITY switch S104, and the OUTPUT AMPLITUDE control R129, by noting their effect on the strobe appearing on the scope. One at a time, rotate each of the five range dials through their entire range, while observing uniform range changes of the strobe on the scope. Correct operation of the 10's dial (S103), until now unchecked, indicates normal operation of the S103 switching and time delay network. If trouble should be experienced, refer to the schematic diagram, and check the circuit for continuity or a short.

f. COMPARATOR CIRCUIT.

Set the COMPARATOR POLARITY switch S801 to correspond to the setting of the OUTPUT POLARITY switch S104. With the REP RATE selector S101 still set at 160, the test scope in aperiodic sweep and synchronized externally from the SCOPE output jack J106, connect a cable between the OUTPUT jack J103 and the COMP INPUT jack J802. This input simulates an external marker in providing the second input signal necessary to operate the comparator circuit.

If the COMPARATOR indicator lights up, it is an indication the circuit works. However, check the waveforms at TP803, TP902, comparing them with the typical illustrations of figure 5-4 sheet 4.

g. ZERO ERROR DETERMINATION.—Replacement of components in the trigger circuits, coincidence circuits, and in the blocking oscillator stages, may affect the zero error. A method of checking and determining the zero error is given in the following procedure.

(1) Train the radar on a fixed target whose range is either known or may be accurately determined by optical or other means.

(2) Connect a cable between the OUTPUT jack (J103) of Range Calibrator TS-573/UP and the marker input connector of the radar, so that the strobe output may appear on the radar screen. Adjust the RANGE IN YARDS selectors until the range marker (from the TS-573/UP) on the radar screen is superposed on the pulse from the fixed target. Mark down the known range as D_1, and the indicated range on Range Calibrator TS-573/UP as R_1.

NOTE

An alternate method of obtaining an indicated range would be by using the comparator circuit of Range Calibrator TS-573/UP, providing the radar has an available video output. This range video signal could then be fed into the COMP INPUT jack J802, and the RANGE IN YARDS selectors adjusted for coincidence.

(3) Train the radar on a second fixed target whose range is known. Repeat the preceding step in obtaining an indicated range to this second target. Mark down the known range as D_2, and the indicated range as R_2.

(4) Record these known and indicated ranges in the formula below, and solve for the zero error.

$$\text{Zero Error} = \frac{D_2R_1 - D_1R_2}{D_2 - D_1}$$

CAUTION

The zero error determined above includes the radar system dead time. If this dead time has not already been compensated for in the radar system, subtract it from the zero error obtained above to get the true zero error of the Range Calibrator TS-573/UP.

(5) Check the result by training the radar on a third fixed target of known range, and obtaining its indicated range.

NOTE

For most accurate results using the above method of zero error determination, the ranges of the fixed targets should not be too alike, and should be as close as possible to the radar. For best results fixed targets should not exceed 4000 yards.

6. UNIT TESTING AND REPAIR.

a. MALE BOARDS.—When a male board is known to be defective, the specific trouble usually can be located with the board out of the equipment. A careful inspection may reveal the defect even before testing. Test involves continuity checking, point-to-point resistance measurements, capacitor checking, and finally tube replacement if nothing else can be found defective.

(1) INSPECTION.—Inspect the plug-in contacts for a bent, broken, rosin-filled, or dirty contact. Ascertain that these contacts all make with their mating connectors on the female, before continuing the check. Examine the board for broken leads, rosin solders, shorts due to solder splashes.

(2) CONTINUITY CHECKING.—Referring to the schematic diagram and to the wiring diagram when necessary, check continuity from the tube electrodes to the output contacts, continuity through the tube filament heater, and continuity to the board components. Some of this continuity checking can be done while resistance checking.

(3) RESISTANCE MEASUREMENTS.—Check resistors by measuring their values from point-to-point on the board, making reference to the schematic diagram. Also check to other points to determine that no shorted or grounded circuits are involved where they should not be. The front resistance across the germanium diodes used in this equipment should not be above 250 ohms, while the back resistance should be a minimum of 150,000 ohms.

(4) CAPACITOR CHECKING.—Where possible, check capacitance values, for an open or shorted capacitor. Refer to the schematic diagram for capacitor values, and to the wiring diagrams for capacitor locations.

(5) TUBE REPLACEMENT.—Unsolder the tube leads, and then push the tube through and out of its securing clamp. Install the new tube by inserting it through the clamp, then orienting it as per sectional view BB on the associated wiring diagram, and finally soldering the tube leads to their respective terminations.

(6) CRYSTAL REPLACEMENT AND ADJUSTMENT OF C202.—Remove male board E202. The crystal, Y201, is located in a corner of the board, and clamped in place. The two terminal pins of the crystal mate into two miniature socket contacts. One of these is fixed in position on an adjacent terminal post, while the other is at the end of a wire coming from capacitor C202. Slip off this free connector from the crystal pin, unfasten the clamp holding the crystal in place, and then remove the crystal.

NOTE

In equipments bearing the serial numbers 1 through 250, the crystal on male board E202 has soldered pig-tail connections. When replacing such crystal units, clip the crystal pig-tail wires even with the miniature contacts. Unfasten the clamp and remove the crystal. The crystal unit with pins (which is the standard and only type supplied by replacement spare parts) may then be installed in the regular manner as described in the following paragraph:

To replace crystal Y201, install the unit in position on male board E202, inserting one of its terminal pins in the fixed miniature contact. Fasten the crystal unit in place by tightening the clamp. Connect the wire previously disconnected, on the second terminal pin of the crystal unit. It may be necessary to use long-nosed pliers to push the miniature contact of this lead properly on to the crystal terminal pin.

Align trimmer capacitor C202 to adjust the crystal oscillator circuit for 25-yard/cycle output, by zero-beating the oscillator output at TP201 against a known frequency standard. The crystal frequency should be set to 6.55598 mc/sec $\pm$0.001%.

b. FEMALE BOARDS.—When a female board is known to be defective, the specific trouble usually can be located with the board by itself out of the equipment. An inspection often uncovers the fault before any electrical test.

(1) INSPECTION.—Inspect the plug-in-contacts carefully. See that they all make contact with their mating connectors when fitted together. Examine the board for broken wires, poor solder joints, short circuit causes, etc.

(2) CONTINUITY AND RESISTANCE CHECKING.—Refer to the schematic diagram for the circuitry, and to the wiring diagram for component location. Check continuity and resistance values from point-to-point, and to other pins to determine that no shorted circuits are involved. Check variable controls to see that they operate properly. Their alignment is given in the bench test and alignment procedure, preceding paragraph 5 of this section. The front resistance

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TABLE 5-1. TUBE OPERATING VOLTAGES AND CURRENTS

TUBE TYPE	SYMBOL	FUNCTION	PLATE (E)	PLATE (MA)	SCREEN (E)	SCREEN (MA)	SUPP. (E)	CATH. (E)	GRID (E)	HEATER (E) A-C
6BF7	V101A	Multivibrator	67	1.9	—	—	—	0	0	6.3
6BF7	V101B	Multivibrator	67	1.9	—	—	—	0	0	6.3
6BF7	V102A	Amplifier	70	5.2	—	—	122	0	0	6.3
6BF7	V102B	Amplifier	109	1.3	—	—	122	4.5	0	6.3
5902	V103	Follower	122	4.4	122	Part of Plate	20.5	20.5	0	6.3
6B57	V104A	Blocking oscillator	122	0.6	—	—	—	14	7	6.3
6B57	V104B	Blocking oscillator	122	0.4	—	—	—	6	0	6.3
5784	V201	Crystal oscillator	105	3.4	70	1.1	85	0	7.5	6.3
5784	V202	Gated amplifier	105	5.3	105	Part of Plate	33	31	0	6.3
6BF7	*V203A	Multivibrator	52.5	5.3	—	—	—	18.5	18.5	6.3
6BF7	†V203B	Multivibrator	97.5	0.8	—	—	—	18.5	12.5	6.3
5840	*V301	Multivibrator	90	9.4	67	3.7	22.7	22.7	0	6.3
5840	†V302	Multivibrator	100	4.7	67	3.7	22.7	22.7	0	6.3
5840	*V303	Multivibrator	86.3	10.7	73.3	3.3	23.3	23.3	0	6.3
5840	†V304	Multivibrator	109.3	3.5	73.3	3.3	23.3	23.3	0	6.3
6BF7	*V401A	Multivibrator	54.8	4.6	—	—	—	16.8	17.1	6.3
6BF7	†V401B	Multivibrator	97.8	0	—	—	—	16.8	12.5	6.3
6BF7	*V402A	Multivibrator	52.5	4.9	—	—	—	17.5	17.6	6.3
6BF7	†V402B	Multivibrator	97.5	0	—	—	—	17.5	10.6	6.3
6BF7	†V403A	Multivibrator	97.5	0	—	—	—	16.5	11.4	6.3
6BF7	*V403B	Multivibrator	53.5	4.7	—	—	—	16.5	16.6	6.3
6BF7	*V404A	Multivibrator	51.5	4.9	—	—	—	17.5	17.6	6.3
6BF7	†V404B	Multivibrator	94.5	0	—	—	—	17.5	11.3	6.3
6BF7	†V501A	Multivibrator	96.0	0	—	—	—	18.0	12.0	6.3
6BF7	*V501B	Multivibrator	56.0	3.5	—	—	—	18.0	18.0	6.3
6BF7	*V502A	Multivibrator	56.0	3.5	—	—	—	18.0	18.0	6.3
6BF7	†V502B	Multivibrator	98.0	0	—	—	—	18.0	11.8	6.3
6BF7	†V503A	Multivibrator	96.0	0	—	—	—	18.8	12.2	6.3
6BF7	*V503B	Multivibrator	53.0	4.7	—	—	—	18.8	18.9	6.3
6BF7	*V504A	Multivibrator	60.0	4.1	—	—	—	17.5	17.7	6.3
6BF7	†V504B	Multivibrator	96.0	0	—	—	—	17.5	12.4	6.3
6BF7	†V601A	Multivibrator	97.2	0	—	—	—	19.2	10.9	6.3
6BF7	*V601B	Multivibrator	55.2	4.6	—	—	—	19.2	19.2	6.3
6BF7	*V602A	Multivibrator	54.8	4.6	—	—	—	18.8	18.9	6.3
6BF7	†V602B	Multivibrator	94.8	0	—	—	—	18.8	11.7	6.3
6BF7	*V603A	Multivibrator	55.5	4.5	—	—	—	18.5	18.6	6.3
6BF7	†V603B	Multivibrator	94.5	0	—	—	—	18.5	12.4	6.3
6BF7	*V604A	Multivibrator	54.6	4.6	—	—	—	19.6	19.9	6.3
6BF7	†V604B	Multivibrator	93.6	0	—	—	—	19.6	11.9	6.3
6BF7	V701A	Multivibrator	90.6	0	—	—	—	20.6	12.1	6.3
6BF7	V701B	Multivibrator	58.8	4.5	—	—	—	20.6	20.9	6.3
6BF7	V702A	Multivibrator	59.6	4.5	—	—	—	20.6	20.6	6.3
6BF7	V702B	Multivibrator	100.6	0	—	—	—	20.6	13.3	6.3
6BF7	V703A	Multivibrator	78.0	1.5	—	—	—	8.0	7.7	6.3
6BF7	V703B	Multivibrator	8.0	0	—	—	—	8.0	0	6.3
6BF7	V704A	Amplifier	109.2	0	—	—	—	8.2	0	6.3
6BF7	V704B	Amplifier	109.2	0	—	—	—	8.2	0	6.3
6BF7	V705A	Amplifier	109.2	0	—	—	—	8.2	0	6.3
6BF7	V705B	Amplifier	109.2	0	—	—	—	8.2	0	6.3
6BF7	V801A	Amplifier	85.1	9.0	—	—	—	2.1	0	6.3
6BF7	V801B	Amplifier	43 to 95.2	1 to 3	—	—	—	0 to 10.2	4.4	6.3

TABLE 5-1. TUBE OPERATING VOLTAGES AND CURRENTS—(Continued)

TUBE TYPE	SYMBOL	FUNCTION	PLATE (E)	PLATE (MA)	SCREEN (E)	SCREEN (MA)	SUPP. (E)	CATH. (E)	GRID. (E)	HEATER (E) A-C
5784	V802	Mixer	5 to 120	0 to 3.5	62 to 122	0.1 max.	45 max.	0 to 60	0	6.3
5784	V803	Mixer	55.5	0.7	122.5	0.1 max.	11	5.5	0	6.3
5840	V901	Multivibrator	60	8.9	76 to 86	2.7	27.5 to 30	27.5 to 30.5	27.5 to 30	6.3
5840	V902	Multivibrator	93	0.8	127 to 131	0.6	27.5 to 30	27.5 to 30.5	20.5 to 22	6.3
6BF7	V903A	Integrator	122	0	—	—	—	7.1	0	6.3
6BF7	V903B	Amplifier	71.2	2.27	—	—	—	1.2	−1.7	6.3
6BF7	†V905A	Multivibrator	99.6	1.9	—	—	—	15.6	8.5	6.3
6BF7	*V905B	Multivibrator	38.6	8.2	—	—	—	15.6	16	6.3

* Conducting condition.
† Non-conducting condition.

CAUTION

The precision (1%) boron-carbon film resistors used in this equipment are mechanically critical to shock and heat. AVOID STRIKING OR BUMPING THESE RESISTORS. DO NOT SUBJECT THEM TO OVERHEAT. When the chassis is removed from its dust cover, be careful not to drop any tools on the terminal boards. When it is necessary to use a soldering iron on a terminal to which one of these resistors is connected, attach a heat-dissipating conductor on to the lead end of the resistor to conduct the heat of the soldering iron away from the body of the resistor.

Damage to these resistors usually affects them either by increasing their resistance above tolerance, or by breaking their electrical circuit. In many cases, testing the resistor immediately after it has been mistreated is meaningless, because the change from normal may not occur until after several hours or days of operation.

across the germanium diodes should not be more than a maximum of 250 ohms, while the back resistance should be a minimum of 150,000 ohms.

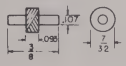
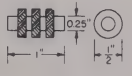
c. MAIN CHASSIS.—When trouble persists and it can not be traced down to a male or female board, it may be a wiring defect in the main chassis. Make use of the wiring diagram, figure 5-36, in tracing out circuits, checking for continuity and against shorts to ground or other circuits. Critical components to check are the mating receptacles and the selector switches.

TABLE 5-2. TUBE CHARACTERISTICS

Tube Type	Filament Voltage (V)	Filament Current (A)	Plate Voltage (V)	Grid Bias (V)	Screen Voltage (V)	Plate Current (Ma)	Screen Current (Ma)	A-C Plate Resistance (Ohms)	Voltage Amplification Factor (Mu)	Tranconductance (Micromhos)		Emission	
										Normal	Minimum	Is (Ma)	Test Volt
6BF7	6.3	0.3	100	*	—	8.0	—	7000	35	4800	3850	30	10 v.
5784	6.3	0.2	120	–2	120	5.2	3.5	—	—	3200	2500	—	—
5840	6.3	0.15	100	*	100	7.5	2.4	230,000	—	5000	4100	—	—
5902	6.3	0.45	110	*	100	30.0	2.2	15,000	—	4200	3200	—	—

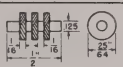
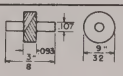
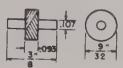
* Obtained by self-bias resistor.

TABLE 5-3. WINDING DATA

DESIGNATION SYMBOL	R. C. A. PART NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D. C. RESISTANCE IN OHMS	IMPEDANCE RATIO	HI POT. A.C. VOLTS	REMARKS
B1001	746647-1								
L101-L109	746521-1		Universal	#36 DNE	49	1.9 max.	—	—	Coil should resonate at 6 mc when shunted by capacitance between 41 mmf and 37 mmf. Nominal inductance of 18 microhenrys.
L111	8889573-1		3 pie Universal	#36 SNE	—	11.0	—	—	

(Continued on page 5-14)

TABLE 5-3. WINDING DATA—(Continued)

DESIGNATION SYMBOL	R. C. A. PART NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D. C. RESISTANCE IN OHMS	IMPEDANCE RATIO	HI POT. A.C. VOLTS	REMARKS
L201	746608-1		3-pie universal	#36 DNE	78; 26 per pie	5 max.	—	—	Coil should resonate at 3 mc. with max. cap. of 75 mmf when tuning core is set for max. ind; with min. cap. of 105 mmf when tuning core is out of coil. Tropicalized as per note 1.
L202	746548-1		3-pie universal	#36 DNE	228; 76 per pie	9 max.	—	—	Using a 1000 cps bridge, the measured inductance should be between 270 microhenrys and 330 microhenrys.
L301-L304	746521-3		Universal	#36 DNE	84	2.8 max.	—	—	Coil should resonate at 2 mc when shunted by capacitance between 135 mmf and 110 mmf. Nominal inductance of 52 mmf.
L801	746521-2		Universal	#36 DNE	74	2.5 max.	—	—	Coil should resonate at 2 mc when shunted by capacitance between 176 mmf and 144 mmf. Nominal inductance of 40 microhenrys.
L901, L902	Same as L301								
L903	Same as L801								
L1001	745460-1					50	—	1500	Hermetically sealed.
L1002	746520-1					95	—	500	Hermetically sealed.
L1003	746520-2						—	500	Hermetically sealed.
T101-T103, T801	745467-1		5-6 1-2 3-4			3-2 3.2 3.2			Hermetically sealed.
T1001	745455-1		1-6 7-8 9-10			1.6 6.8 0.014		1500	Hermetically sealed.

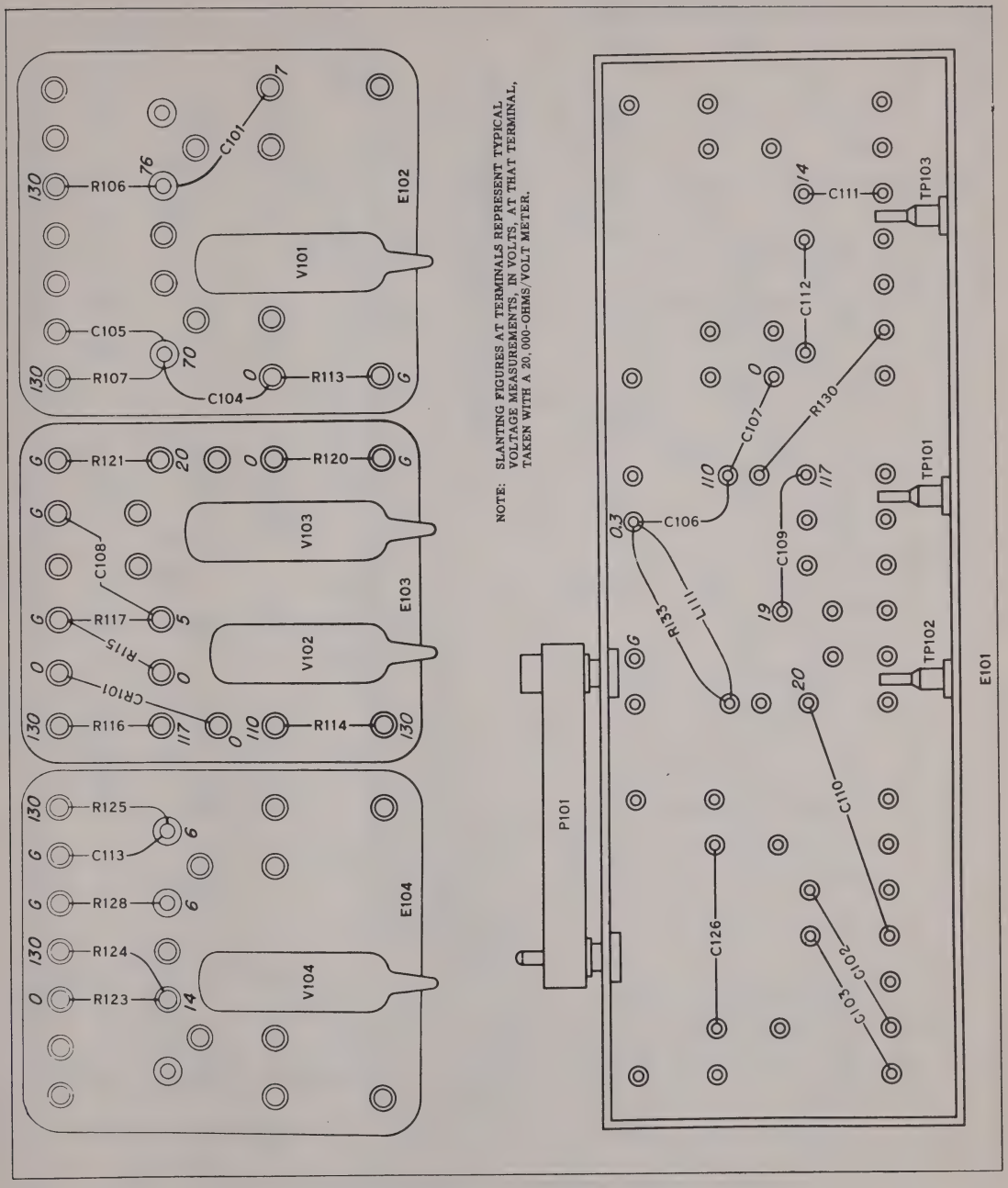


Figure 5-5. E101 Component and Voltage Measurement Chart

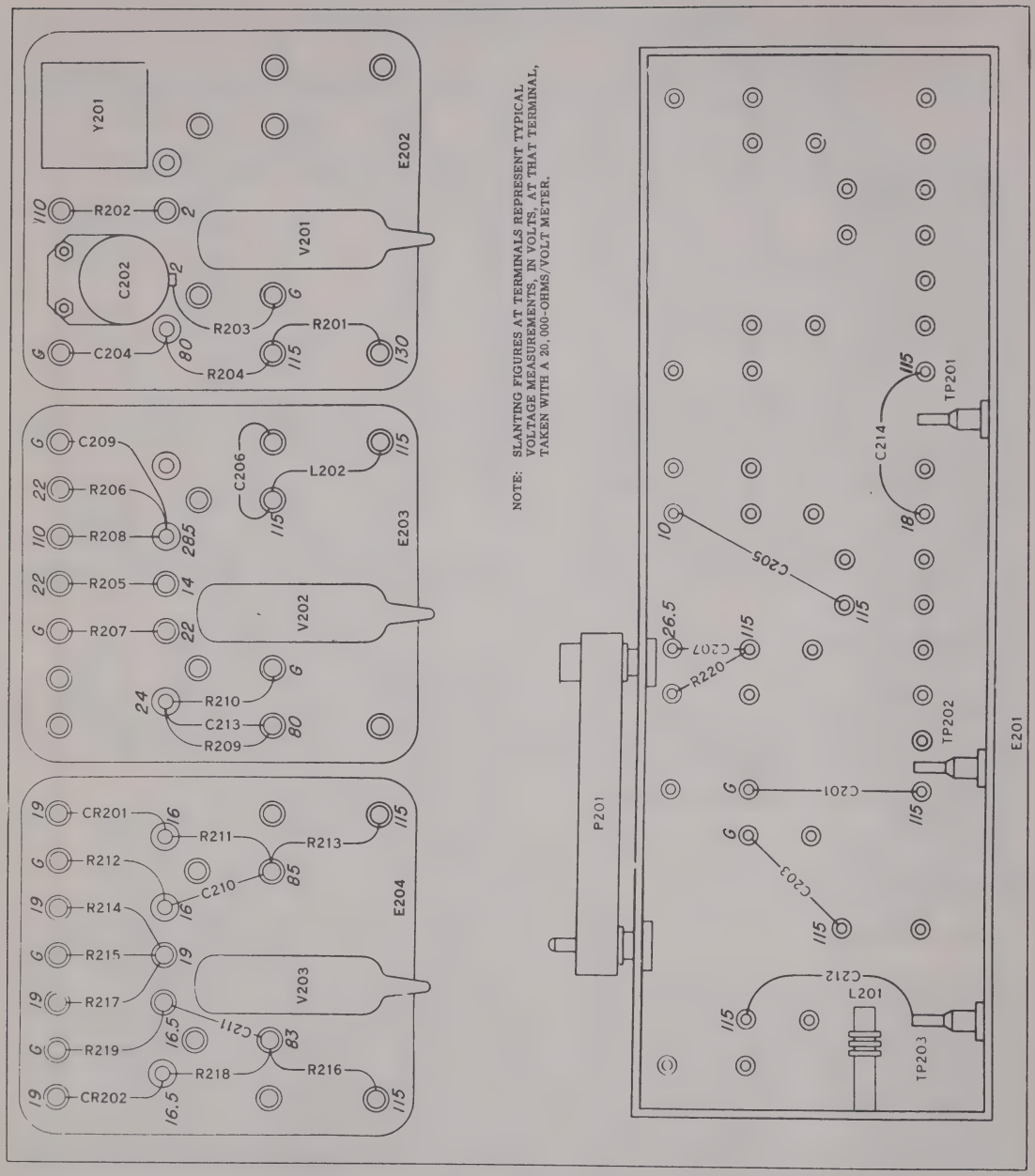


Figure 5-6. E201 Component and Voltage Measurement Chart

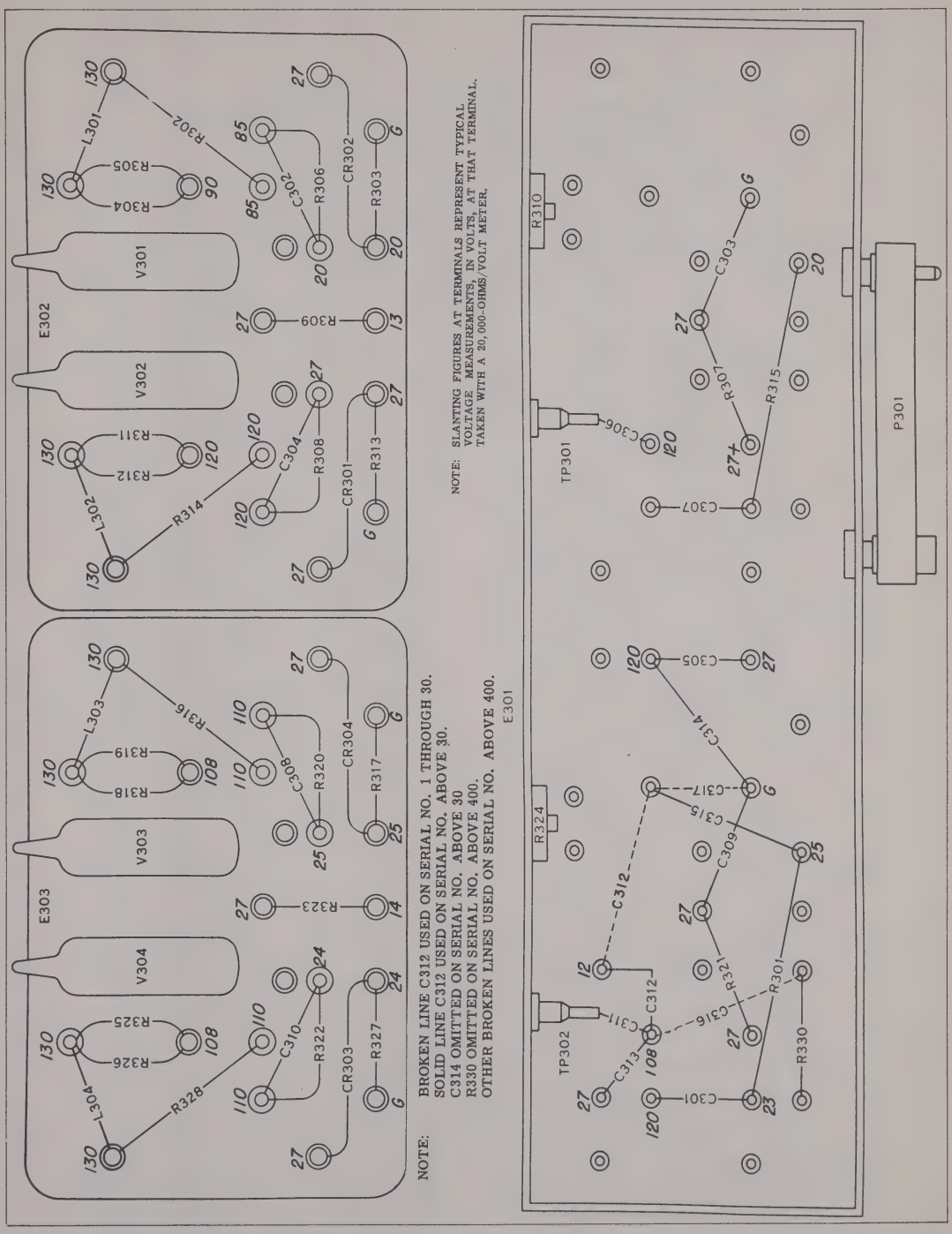


Figure 5-7. E301 Component and Voltage Measurement Chart

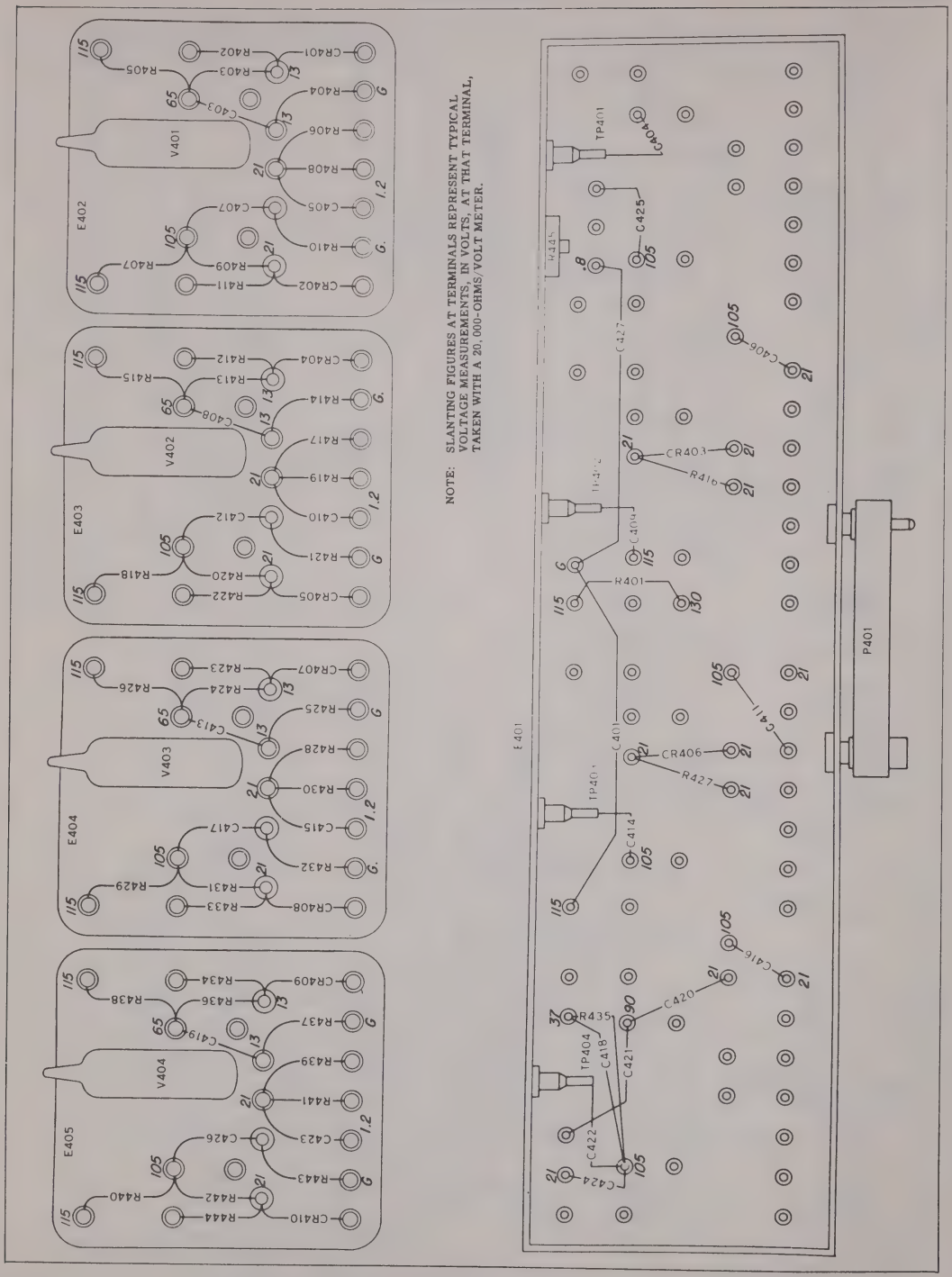


Figure 5-8. E401 Component and Voltage Measurement Chart

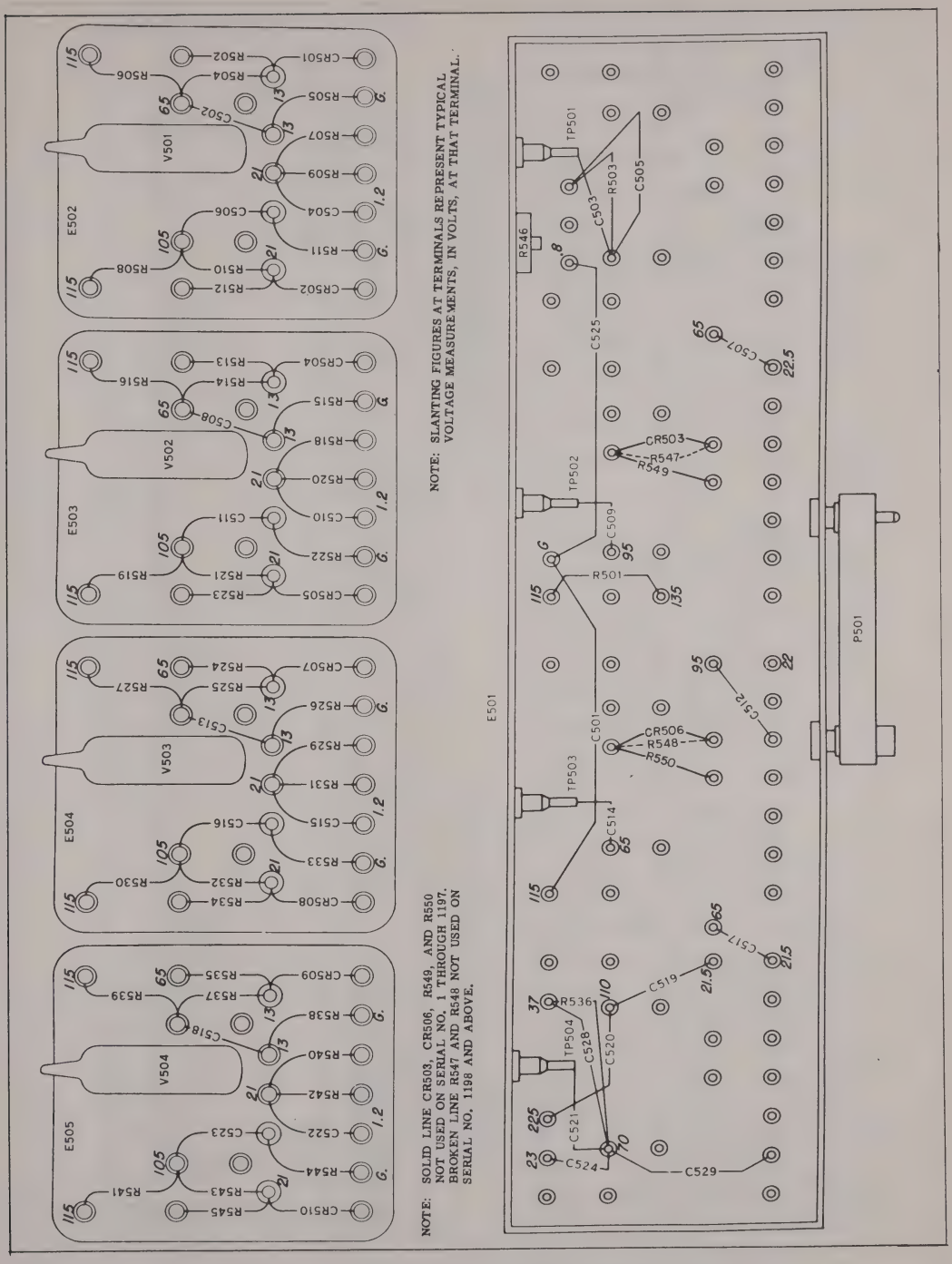


Figure 5-9. E501 Component and Voltage Measurement Chart

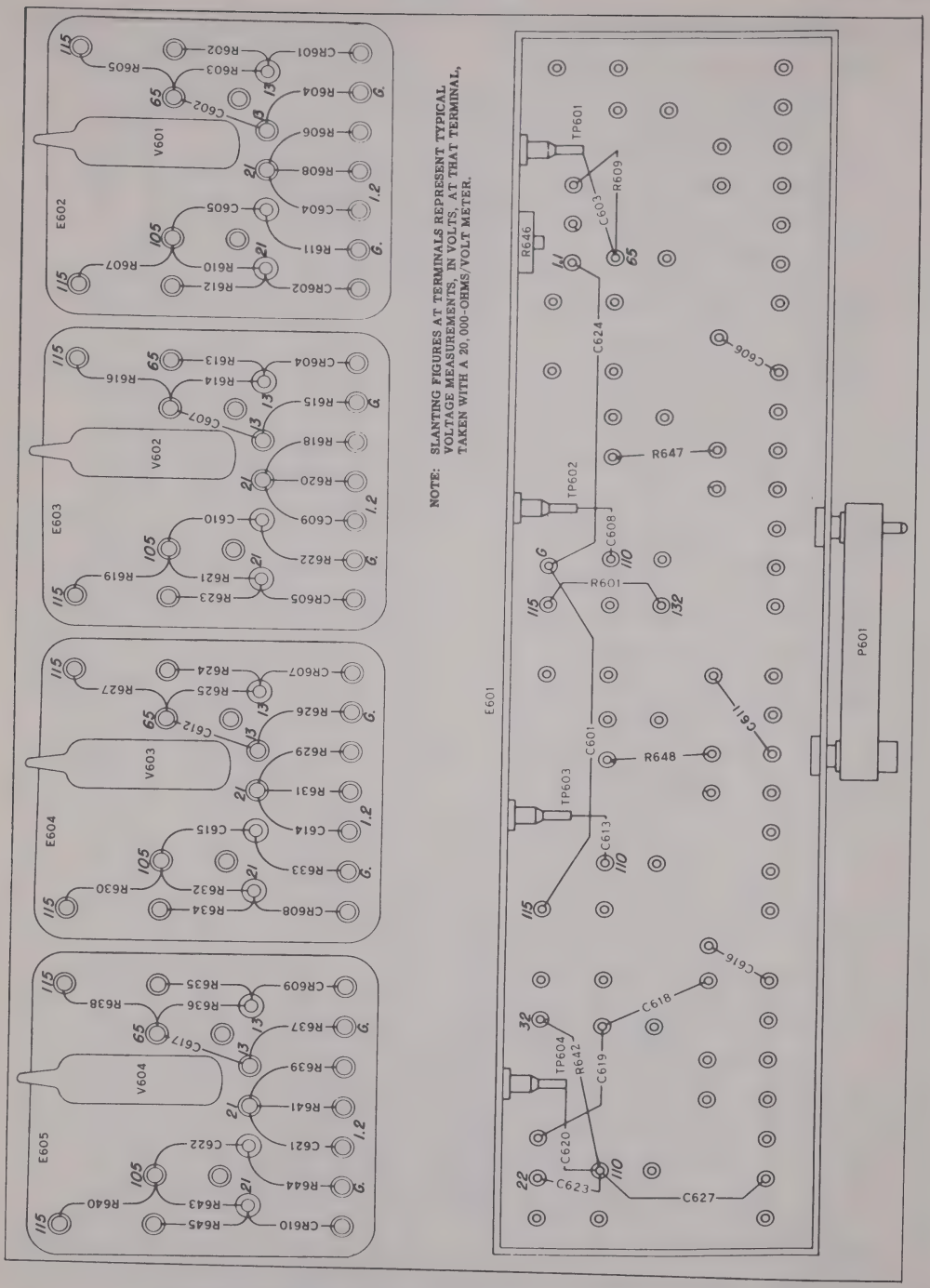


Figure 5-10. E601 Component and Voltage Measurement Chart

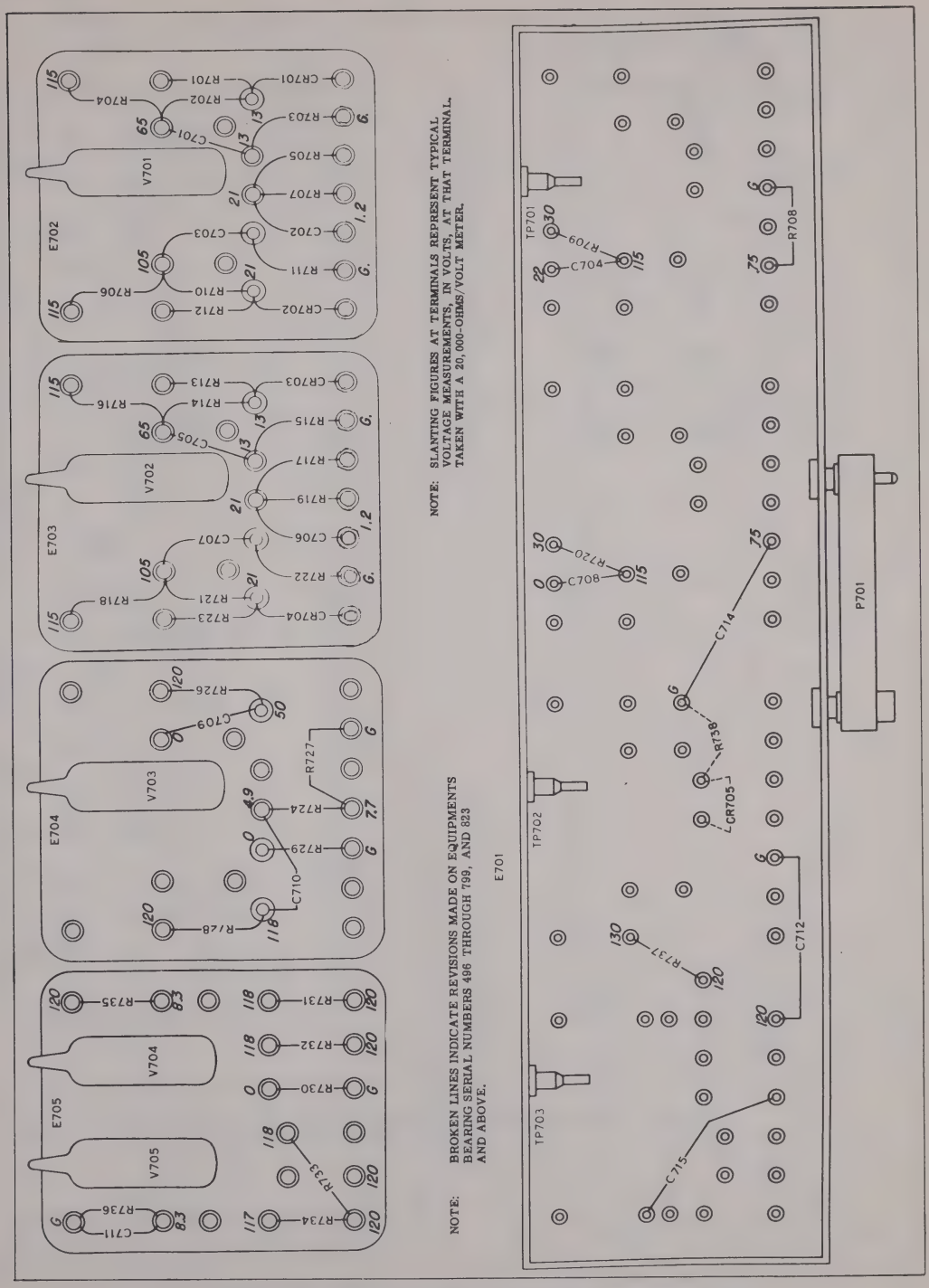


Figure 5-11. E701 Component and Voltage Measurement Chart

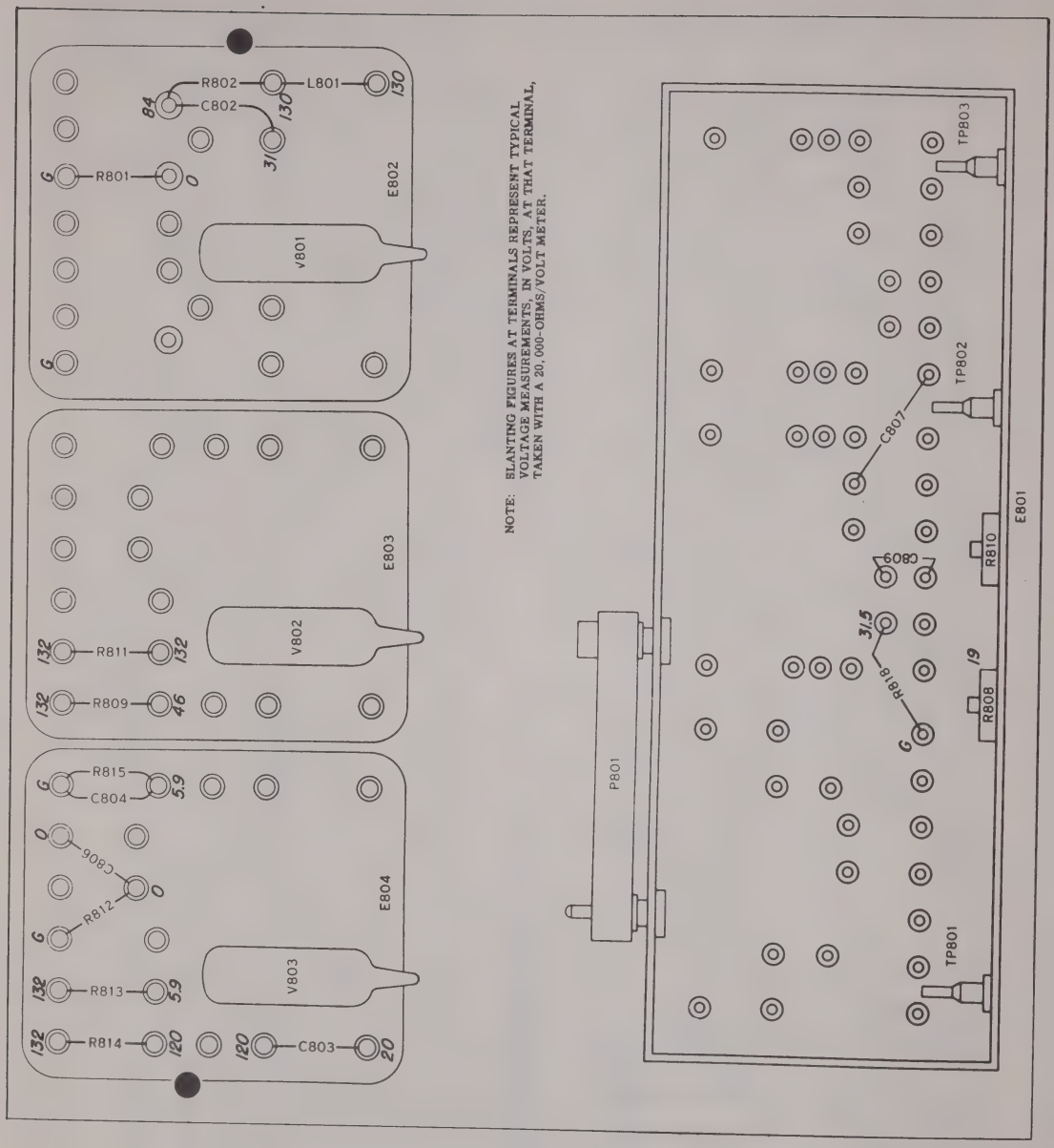


Figure 5-12. E801 Component and Voltage Measurement Chart

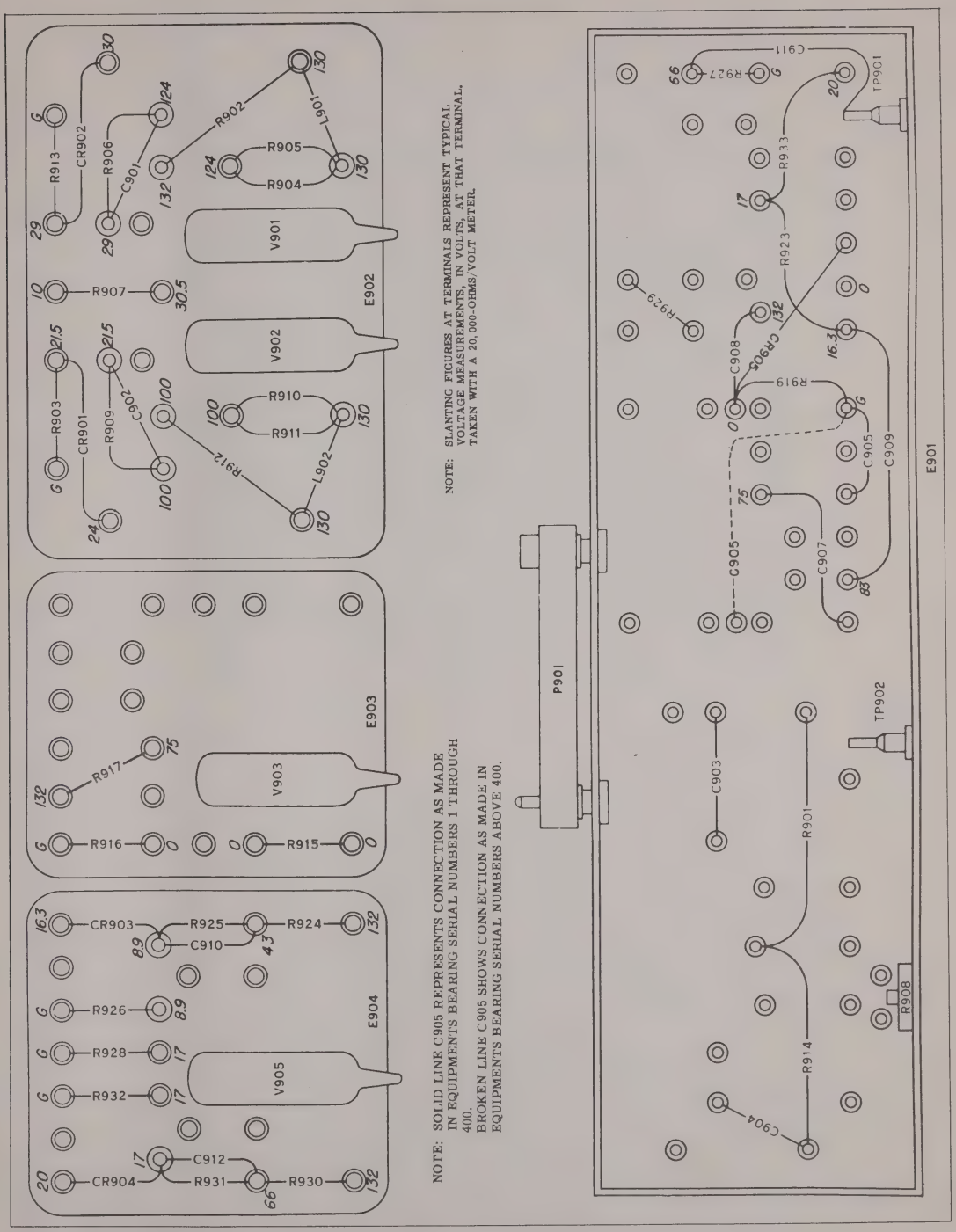
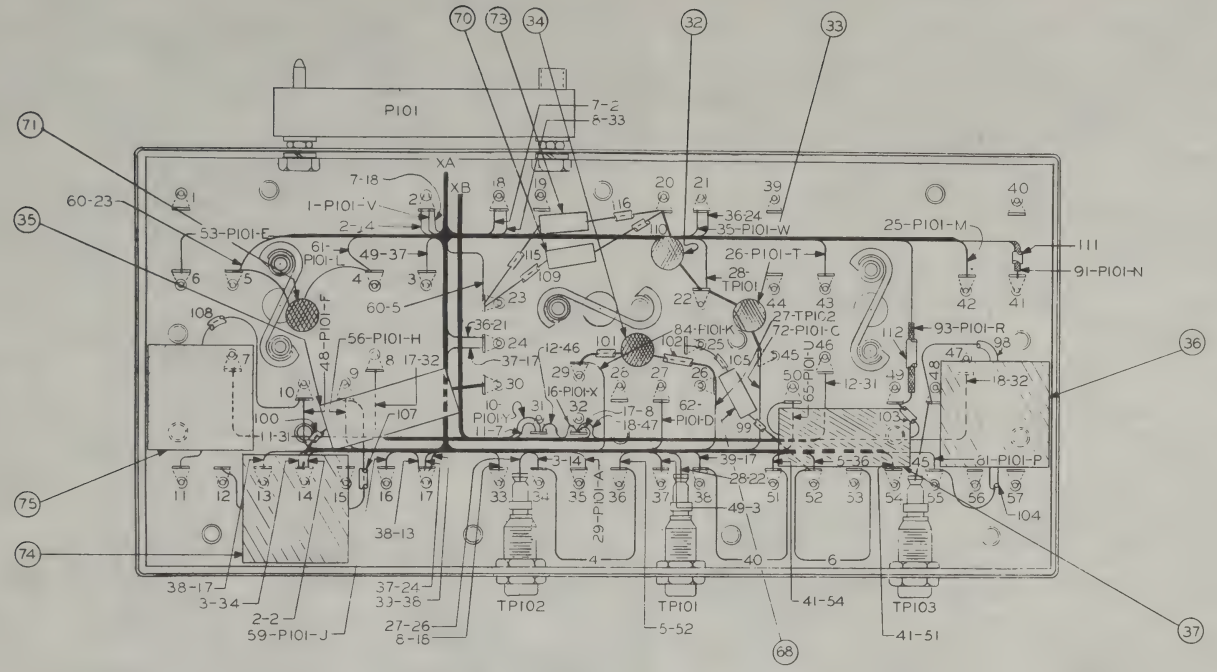
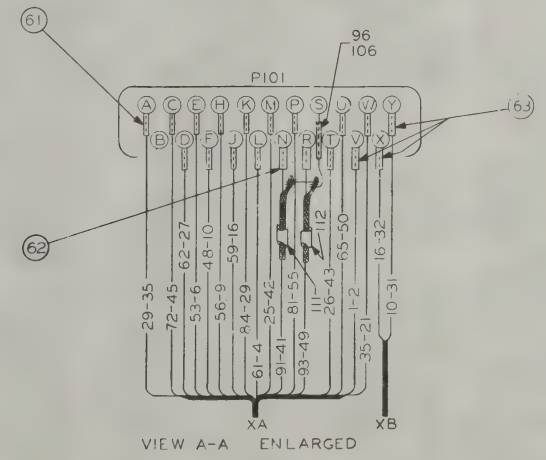


Figure 5-13. E901 Component and Voltage Measurement Chart

NAVSHIPS 91760
NAVSHIPS 91760

NAVSHIPS 91760





BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E101

Balloon Reference	Symbol Designation
14	TP101
15	TP102
16	TP103
17	P101
32	C106
33	C107
34	C109
35	C110
36	C111
37	C112
68	R130
70	L111
71	C126
73	R133
74	C102
75	C103

WIRE TABLE			
WIRE NO.	DESCRIPTION		
(1-8)	WIRE-WHT-BLK TR. SEE NOTE 6	AWG #20	10/010
(10-12)	-BROWN TR.	AWG #20	10/010
(16-18)	-BLK/BRN TR.	AWG #20	10/010
(25-29)	-BLUE TR.	AWG #22	7/010
(35-41)	-RED TR.		
45	-YELLOW TR.		
(48-49)	GREEN TR.		
54	-GRN/BLK TR.		
56	-GRN/BRN TR.		
(59-61)	-GRN/RED TR.		
62	-YELLOW/GRN TR.		
65	-RED/GRN TR.		
72	-BLK/GRN TR.		
81	-YELLOW/BLK TR.		
84	-BLUE/BROWN TR.		
91	-GRN/BRN TR. SHIELDED		
93	WHT GRN/BLK TR. SHIELDED	AWG #22	7/010
96	WIRE-TINNED COPPER		0.020 DIA.
(98-105)(115-116)	SLEEVING-GLASS (BLK)		0.034 I.D.
(106-110)	SLEEVING-GLASS (BLK)		0.066 I.D.
(111-112)	SLEEVING-GLASS (BLK)		0.085 I.D.

NOTE 1 - CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2 - CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE USING NYLON CORD.

NOTE 4 - NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE; THUS 24-17, 24=WIRE NUMBER AND 17=TERMINAL 17 OF CHASSIS AS SHOWN ON THIS DRAWING.

NOTE 5 - FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

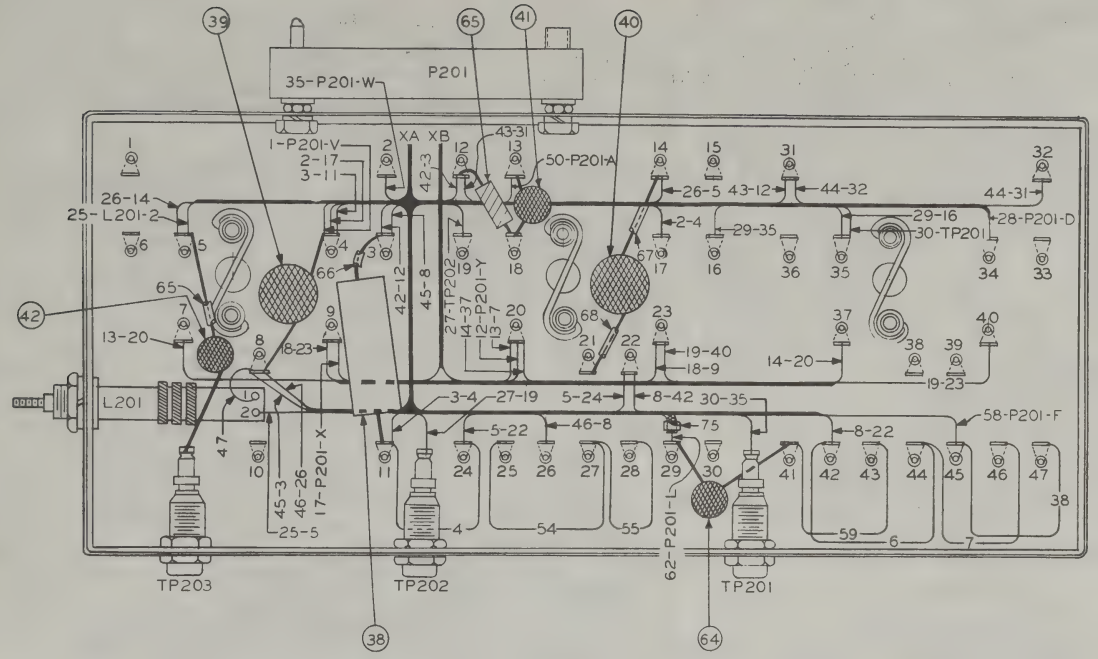
NOTE 6 - ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

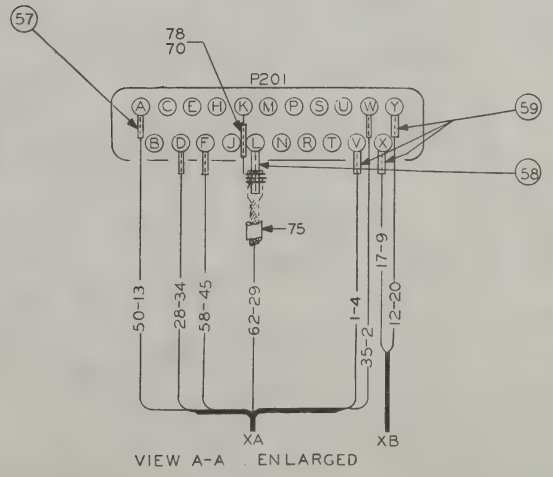
NOTE 8 - SEAL UNGROUNDED ENDS OF SHIELDS USING CLEAR GLYPTAL.

NOTE 9 - ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINAL TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

Figure 5-14. Wiring Diagram, Female Board E101

NAVSHIPS 91760
NAVSHIPS 91760





BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E201

Balloon Reference	Symbol Designation
14	TP201
15	TP202
16	TP203
17	P201
19	L201
38	C201
39	C203
40	C205
41	C207
42	C212
64	C214

WIRE TABLE

WIRE NO.	DESCRIPTION		
(1-8)	WIRE-WHT-BLK TR. SEE NOTE 6	AWG #20	10/010
(12-14)	-BRN TR.	AWG #20	10/010
(17-19)	-BLK/BRN TR.	AWG #20	10/010
(25-30)	-BLUE TR	AWG #22	7/010
35	-RED TR		
38	-GRN/BRN TR.		
(42-47)	-RED/BLUE TR		
50	-GRN/RED TR.		
(54-55)	-YEL/GRN TR.		
(58-59)	-BLUE/BRN TR.		
62	WIRE-WHT-GRN/BRN TR SHIELDED	AWG #22	7/010
(65-68)	SLEEVING-GLASS (BLK)	0.034	I.D.
70	SLEEVING-GLASS (BLK)	0.066	I.D.
75	SLEEVING-GLASS (BLK)	0.085	I.D.
78	WIRE-TINNED COPPER	0.020	DIA.

NOTE 1 - CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2 - CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE

NOTE 4 - NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE; THUS 62-45, 62=WIRE NUMBER AND 45=TERMINAL 45 OF CHASSIS AS SHOWN ON THIS DRAWING.

NOTE 5 - FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

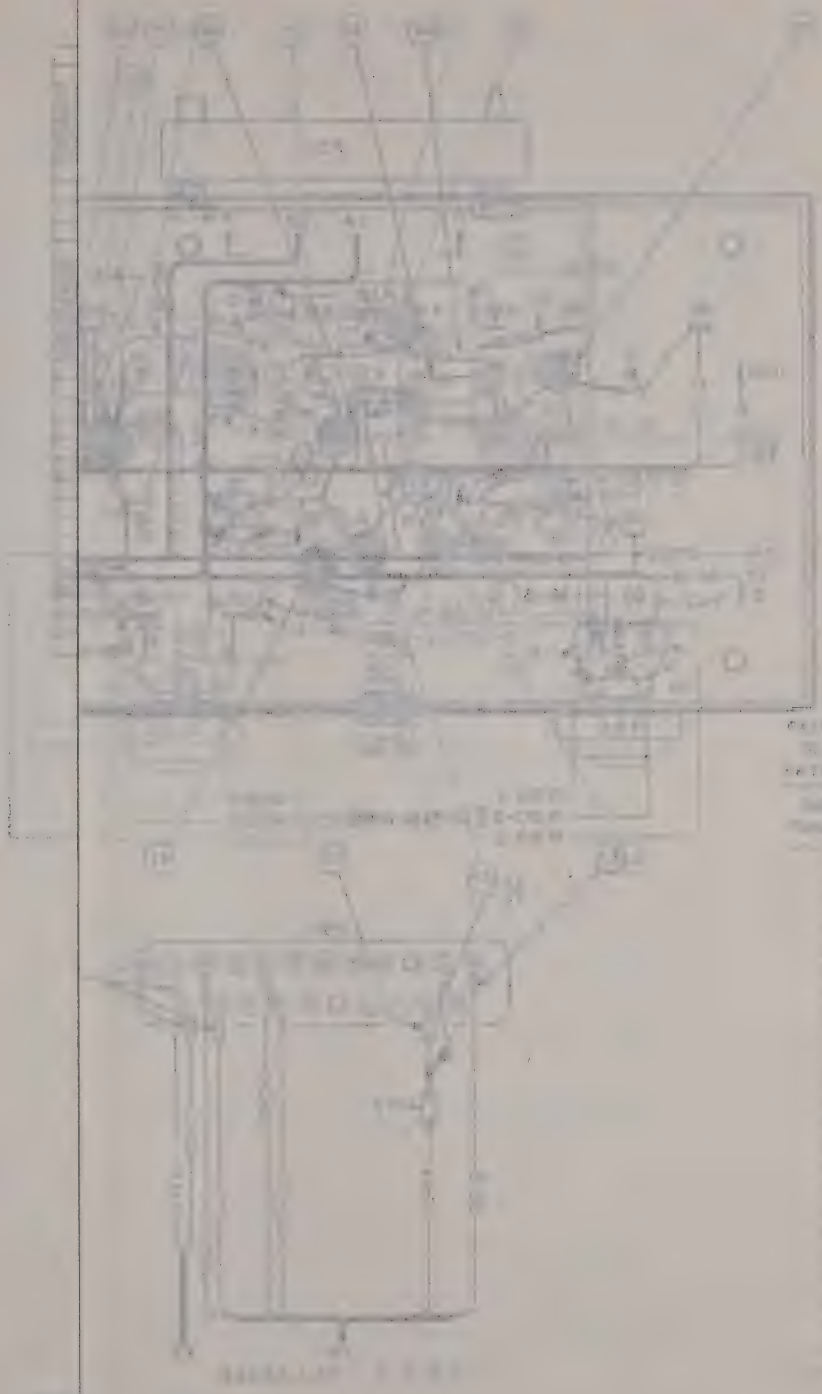
NOTE 6 - ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

NOTE 8 - SEAL UNGROUNDED ENDS OF SHIELDS USING GLYPTAL CEMENT.

NOTE 9 - ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINAL TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

Figure 5-15. Wiring Diagram, Female Board E201

394291 O - 56

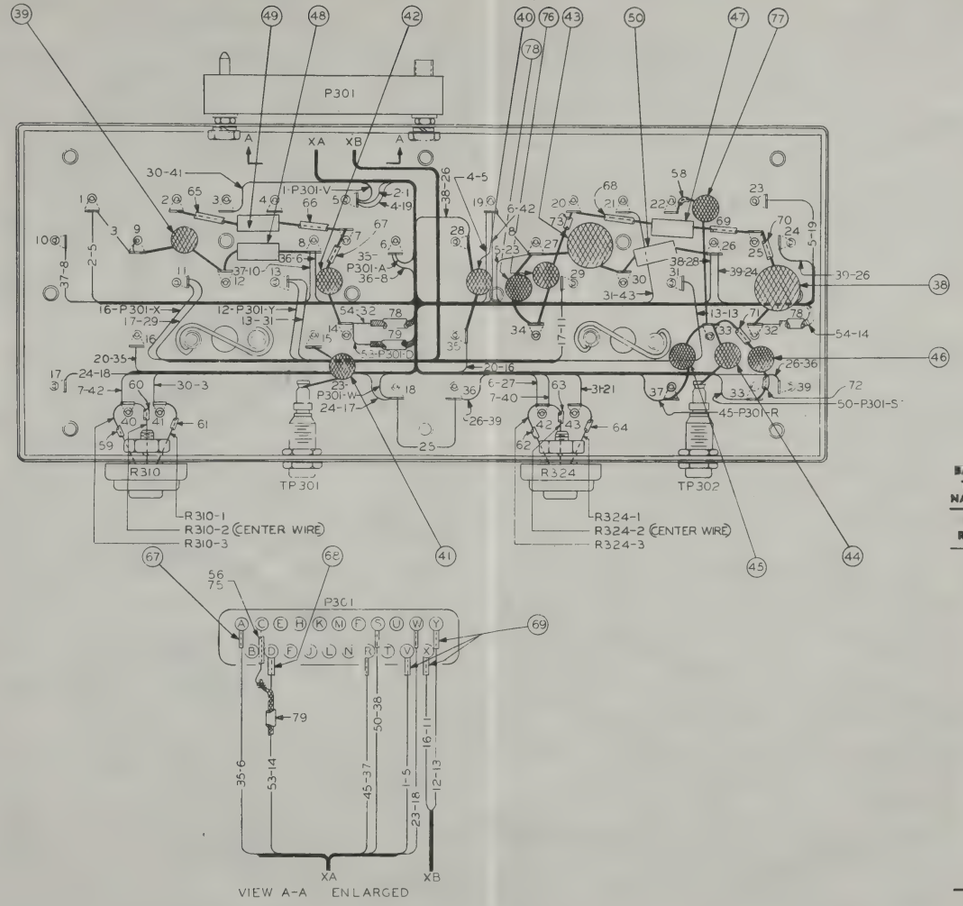


NAVSHIPS 91760

NAVSHIPS 91760

VARIATIONS IN UNITS

SERIAL NUMBER	VARIATION
1 through 30	1. Contained Capacitor C314 (part no. 75) connected between terminals 35 and 27. 2. Capacitor C312 (part no. 45) was connected between terminals 35 and 27.
1 through 400	1. Contained Resistor R330 (part no. 74) connected between terminals 22 and 23. 2. Capacitors C316 (part no. 77) and capacitor C317 (part no. 78) were not used.



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E301

Balloon Reference	Symbol Designation
14	R324
15	R310
16	TP302
17	TP301
18	P301
38	C301
39	C303
40	C305
41	C306
42	C307
43	C309
44	C311
45	C312
46	C313
47	R301
48	R307
49	R315
50	R321
74	R330
75	C314
76	C315
77	C316
78	C317

WIRE NO.	WIRE TABLE DESCRIPTION		
(1-8)	WIRE-WHT-BLK TR. SEE NOTE 6	AWG #20	10/0.0
(12-13)	-BROWN TR	AWG #20	10/010
(16-17)	-BLK/BRN TR.	AWG #20	10/010
20	-BLUE TR.	AWG #22	7/010
(23-26)	-RED TR		
(30-31)	-YEL/RED TR.		
(35-39)	-GRN/RED TR		
45	-GRN/BRN TR		
50	-GRN/BLK TR.		
(53-54)	WHT-GRN/BRN TR.	SHIELDED AWG #22	7/010
56	WIRE-TINNED COPPER		0.020 DIA
(58-73)	SLEEVING-GLASS (BLK)		0.034 I.D.
75	SLEEVING-GLASS (BLK)		0.066 I.D.
(78-79)	SLEEVING-GLASS (BLK)		0.085 I.D.

NOTE 1 - CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2 - CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE USING NYLON CORD

NOTE 4 - NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE; THUS 39-26, 39=WIRE NUMBER AND 26=TERMINAL 26 OF CHASSIS AS SHOWN ON THIS DRAWING.

NOTE 5 - FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

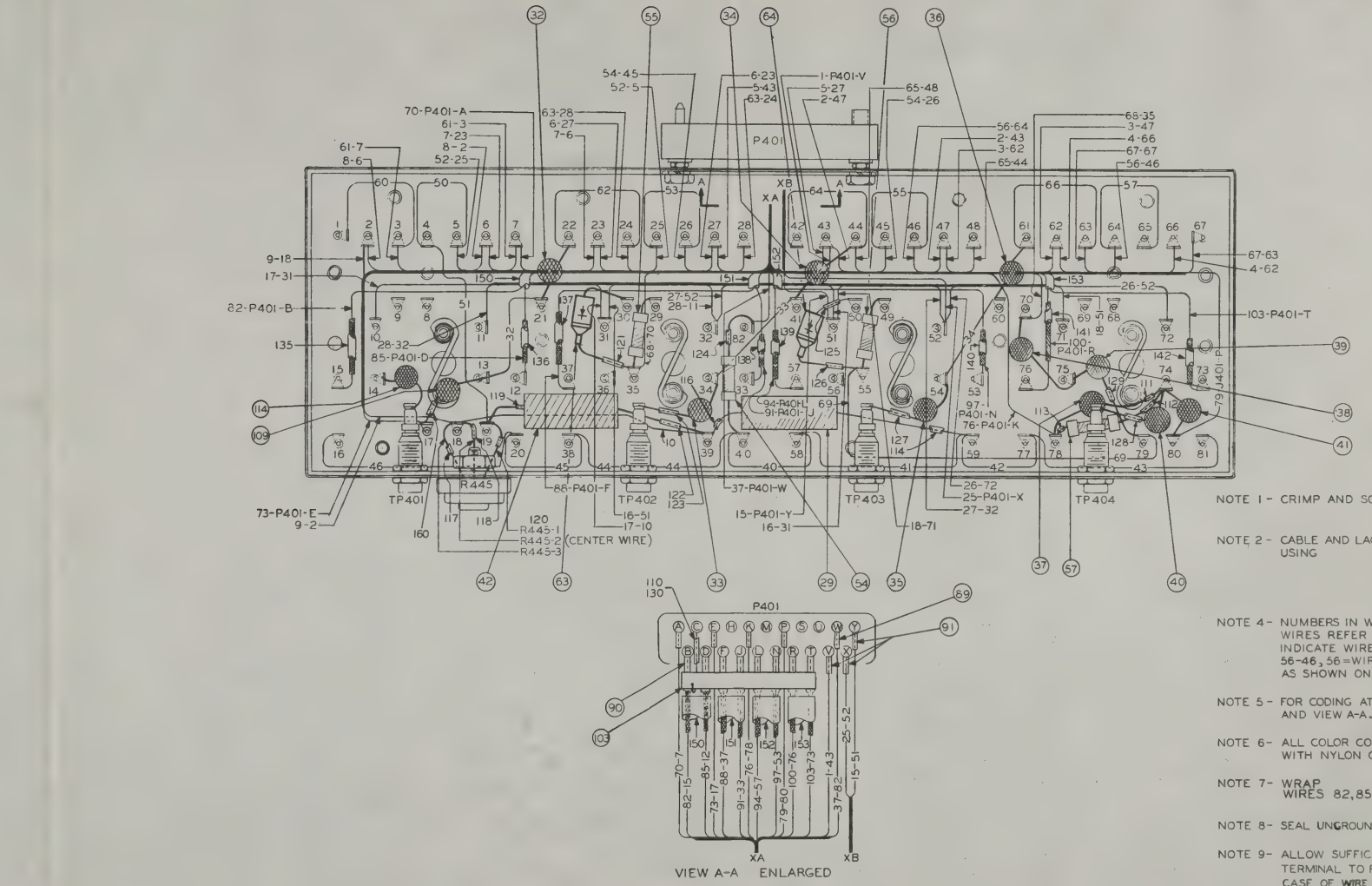
NOTE 6 - ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

NOTE 8 SEAL UNGROUNDED ENDS OF SHIELDS USING CLEAR GLYPTAL.

NOTE 9 ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINAL TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

Figure 5-16. Wiring Diagram, Female Board E301

394291 O - 56



WIRE TABLE			
WIRE NO.	DESCRIPTION		
(1-10)	WIRE-WHT-BLK TR. SEE NOTE 6	AWG #20	10/010
(15-18)	-BROWN TR.	AWG #20	10/010
(25-28)	-BLK/BRN TR.	AWG #20	10/010
(32-34)	-BLUE TR.	AWG #22	7/010
37	-RED TR		
(40-46)	-RED/BLUE TR.		
(50-57)	-YELLOW/RED TR.		
(60-70)	-GREEN/RED TR.		
73	-BRN/RED TR.		
76	-BRN/GREEN TR.		
79	-BRN/BLUE TR.		
82	-GRN/RED TR SHIELDED		
85	-GRN/BRN TR.		
88	-BLU/BRN TR.		
91	-GRN/BLK TR.		
94	-YELLOW/GRN TR.		
97	-RED/BLK TR.		
100	-YEL/BLK TR.		
103	-WHT-RED/GRN TR SHIELDED	AWG #22	7/010
110	WIRE-TINNED COPPER		0.020 DIA
(111-129,160)	SLEEVING-GLASS (BLK)		0.034 I.D.
130	SLEEVING-GLASS (BLK)		0.066 I.D.
(135-142)	SLEEVING-GLASS (BLK)		0.085 I.D.
(150-153)	SLEEVING-GLASS (BLK)		0.166 I.D.

NOTE 1 - CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2 - CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE USING NYLON CORD.

NOTE 4 - NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE; THUS 56-46, 56 = WIRE NUMBER AND 46 = TERMINAL 46 OF CHASSIS AS SHOWN ON THIS DRAWING.

NOTE 5 - FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

NOTE 6 - ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

NOTE 7 - WRAP COPPER RIBBON AROUND SHIELD PIGTAILS OF WIRES 82,85,88,91,94,97,100 AND 103 THEN SOLDER

NOTE 8 - SEAL UNGROUNDED ENDS OF SHIELDS USING ITEM 100 CLEAR GLYPTAL.

NOTE 9 - ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINAL TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

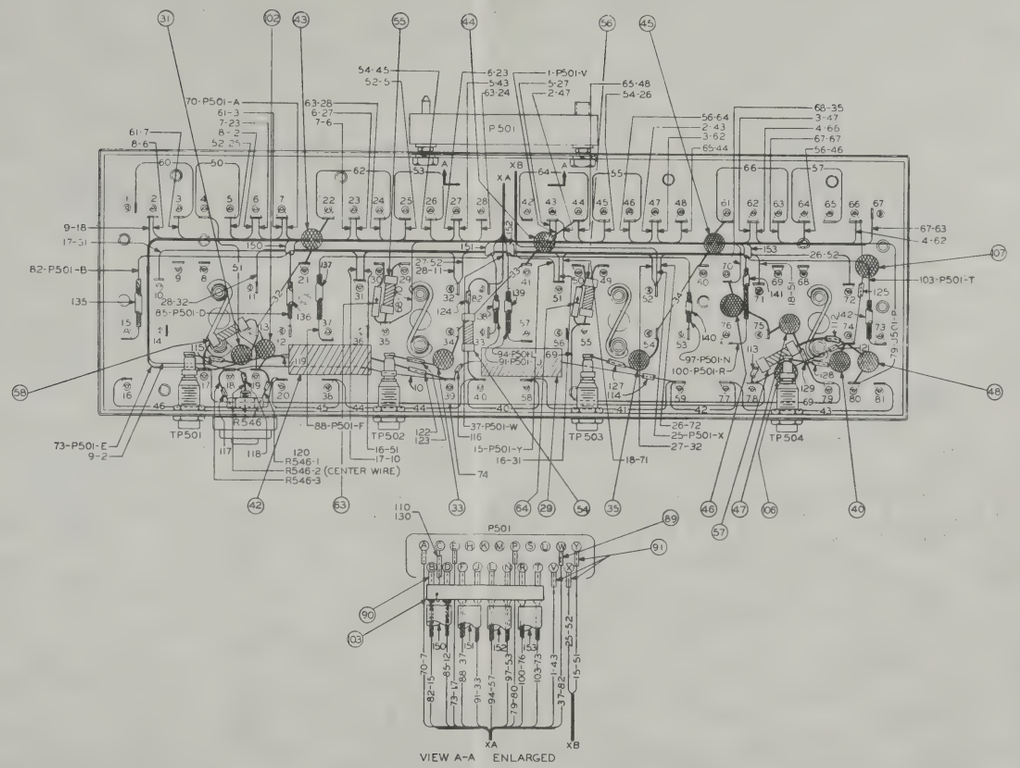
BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E401

Balloon Reference	Symbol Designation
14	R445
15	TP404
16	TP403
17	TP402
18	TP401
19	P401
29	C401
30	C402
32	C406
33	C409
34	C411
35	C414
36	C416
37	C418
38	C420
39	C421
40	C422
41	C424
42	C427
54	R401
55	R416
56	R427
57	R435
63	CR403
64	CR406
109	C425
114	C404

Figure 5-17. Wiring Diagram, Female Board E401

VARIATIONS IN UNITS

SERIAL NUMBER	VARIATIONS
1 through 1197	1. Contained resistor R547 (part no. 104) connected between terminals 30 and 35. 2. Contained resistor R548 (part no. 105) connected between terminals 50 and 55. 3. Resistors R549 (part no. 55), R550 (part no. 56) and crystals CR503 (part no. 63), CR506 (part no. 64) were not used.



WIRE NO	DESCRIPTION		
(1-10)	WIRE-WHT-BLK TR. SEE NOTE 6	AWG #20	10/010
(15-18)	-BROWN TR.	AWG #20	10/010
(25-28)	-BLK/BRN TR.	AWG #20	10/010
(32-34)	-BLUE TR.	AWG #22	7/010
37	-RED TR.		
(40-46)	-RED/BLUE TR.		
(50-57)	-YELLOW/RED TR.		
(60-70)	-GREEN/RED TR.		
(73-74)	-BRN/RED TR.		
	-BRN/GREEN TR.		
79	-BRN/BLUE TR.		
82	-GRN/RED TR. SHIELDED		
85	-GRN/BRN TR.		
88	-BLU/BRN TR.		
91	-GRN/BLK TR.		
94	-YELLOW/GRN TR.		
97	-RED/BLK TR.		
100	-YEL/BLK TR.		
103	-WHT-RED/GRN TR. SHIELDED	AWG #22	7/010
10	WIRE-TINNED COPPER	0.020 DIA	
(112-29)	SLEEVING-GLASS (BLK)	0.034 I.D.	
30	SLEEVING-GLASS (BLK)	0.066 I.D.	
(135-142)	SLEEVING-GLASS (BLK)	0.085 I.D.	
(150-153)	SLEEVING-GLASS (BLK)	0.166 I.D.	

NOTE 1- CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS.

NOTE 2- CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE.

NOTE 4- NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE; THUS 56-46, 56=WIRE NUMBER AND 46=TERMINAL 46 OF CHASSIS AS SHOWN ON THIS DRAWING.

NOTE 5- FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

NOTE 6- ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

NOTE 8- SEAL UNGROUNDED ENDS OF SHIELDS USING CLEAR GLYPTAL.

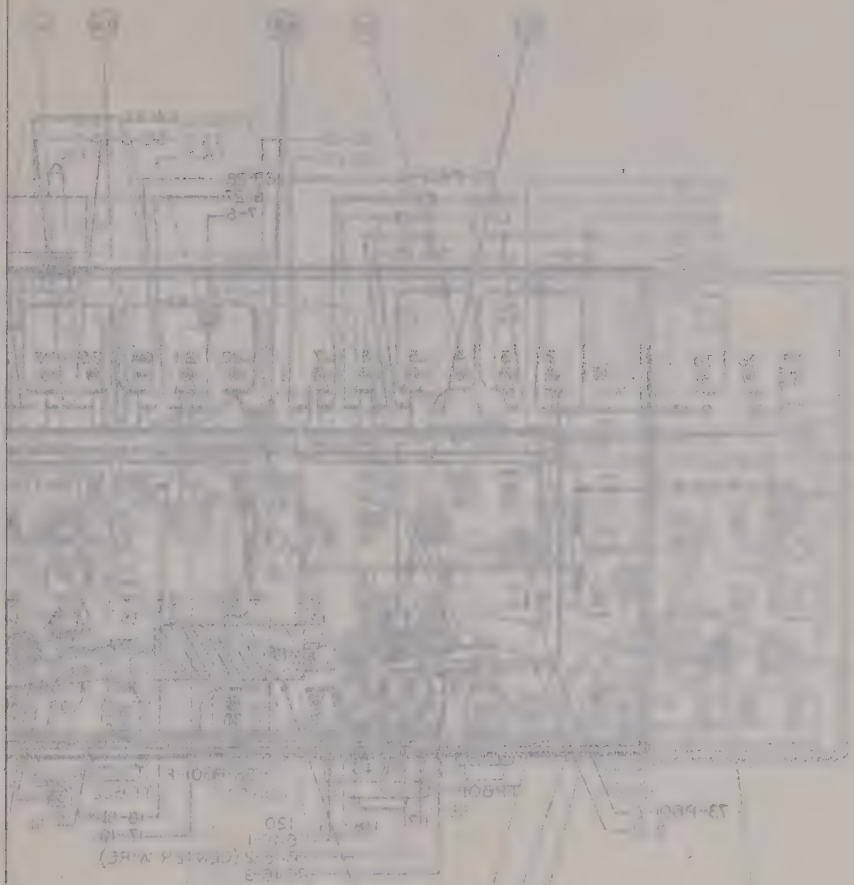
NOTE 9- ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINAL TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

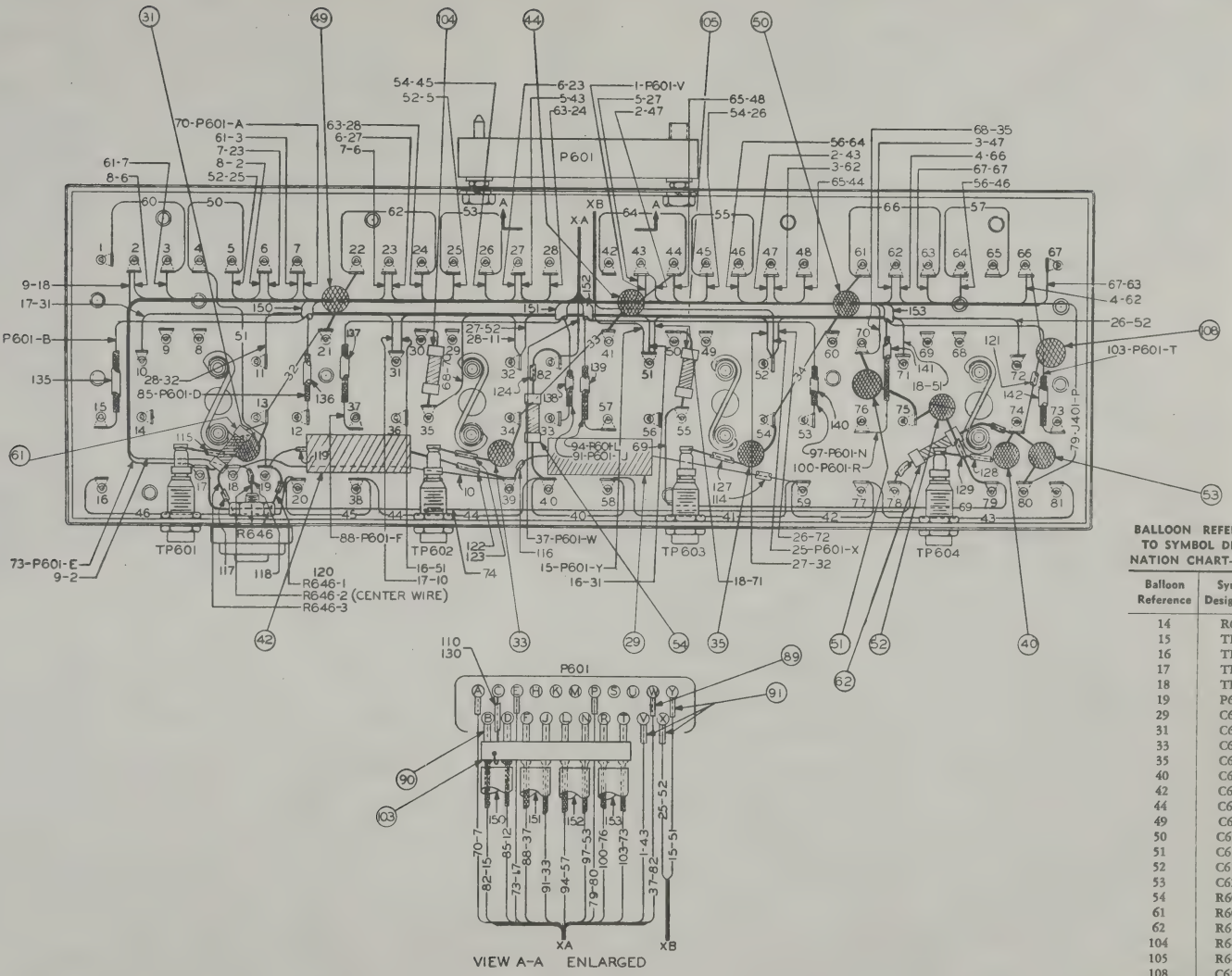
BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E501

Balloon Reference	Symbol Designation
14	R546
15	TP504
16	TP503
17	TP502
18	TP501
19	P501
29	C501
31	C503
33	C509
35	C514
40	C521
42	C525
43	C507
44	C512
45	C517
46	C519
47	C520
48	C524
54	R501
55	R549
56	R550
63	CR503
64	CR506
104	R547
105	R548

Figure 5-18. Wiring Diagram, Female Board E501

394291 O-56





BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E601

Balloon Reference	Symbol Designation
14	R646
15	TP604
16	TP603
17	TP602
18	TP601
19	P601
29	C601
31	C603
33	C608
35	C613
40	C620
42	C624
44	C611
49	C606
50	C616
51	C618
52	C619
53	C623
54	R601
61	R609
62	R642
104	R647
105	R648
108	C627

WIRE TABLE

WIRE NO.	DESCRIPTION		
(1-10)	WIRE-WHT-BLK TR. SEE NOTE 6	AWG #20	10/010
(15-18)	-BROWN TR.	AWG #20	10/010
(25-28)	-BLK/BRN TR.	AWG #20	10/010
(32-34)	-BLUE TR.	AWG #22	7/010
37	-RED TR.		
(40-46)	-RED/BLUE TR.		
(50-57)	-YELLOW/RED TR.		
(60-70)	-GREEN/RED TR.		
(73-74)	-BRN/RED TR.		
	-BRN/GREEN TR.		
79	-BRN/BLUE TR.		
82	-GRN/RED TR. SHIELDED		
85	-GRN/BRN TR.		
88	-BLU/BRN TR.		
91	-GRN/BLK TR.		
94	-YELLOW/GRN TR.		
97	-RED/BLK TR.		
100	-YEL/BLK TR.		
103	-WHT-RED/GRN TR. SHIELDED	AWG #22	7/010
110	WIRE-TINNED COPPER		0.020 DIA.
(112-129)	SLEEVING-GLASS (BLK)		0.034 I.D.
130	SLEEVING-GLASS (BLK)		0.066 I.D.
(135-142)	SLEEVING-GLASS (BLK)		0.085 I.D.
(150-153)	SLEEVING-GLASS (BLK)		0.166 I.D.

NOTE 1- CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2- CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE

NOTE 4- NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE; THUS 56-46, 56=WIRE NUMBER AND 46=TERMINAL 46 OF CHASSIS AS SHOWN ON THIS DRAWING.

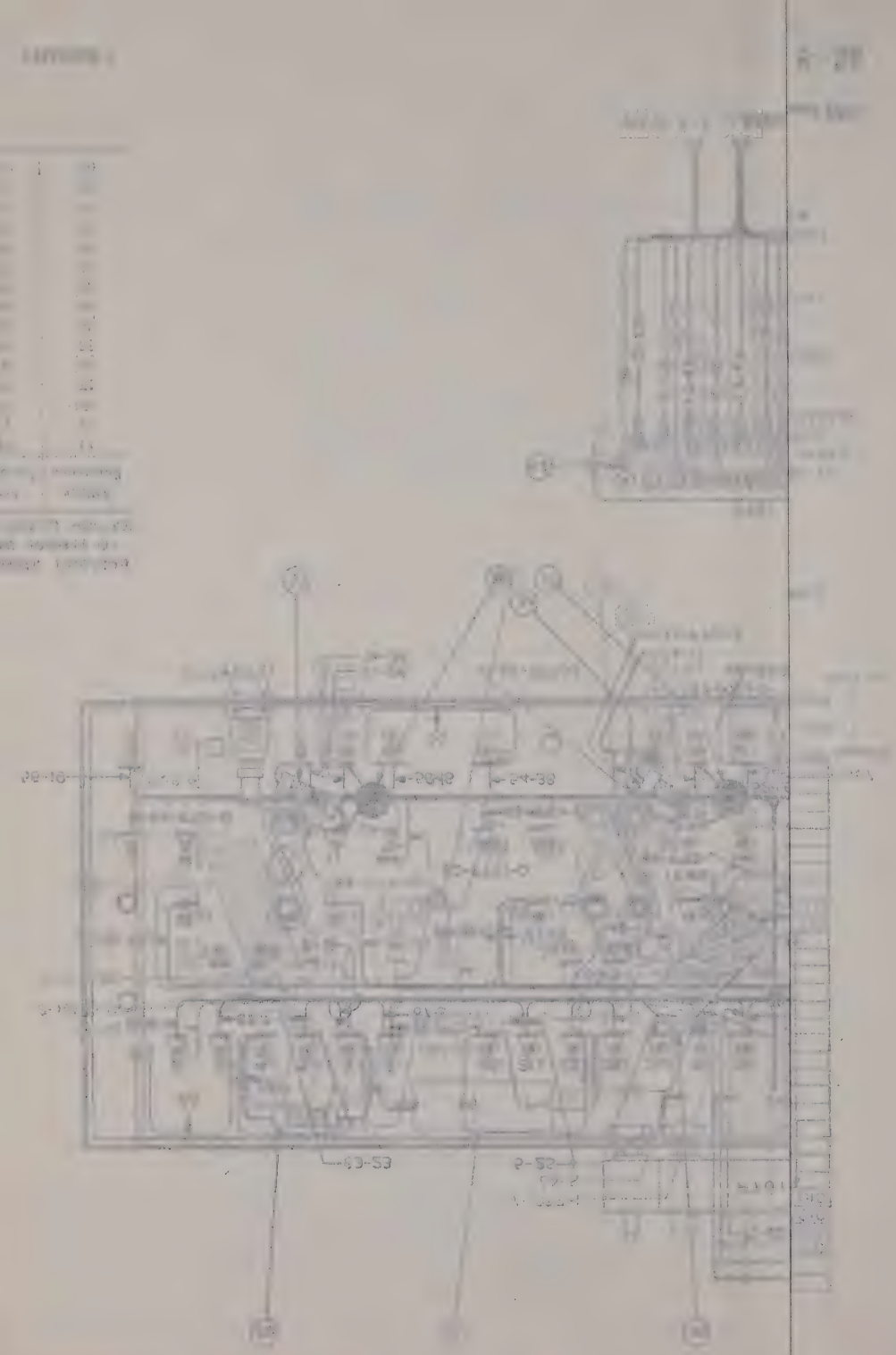
NOTE 5- FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

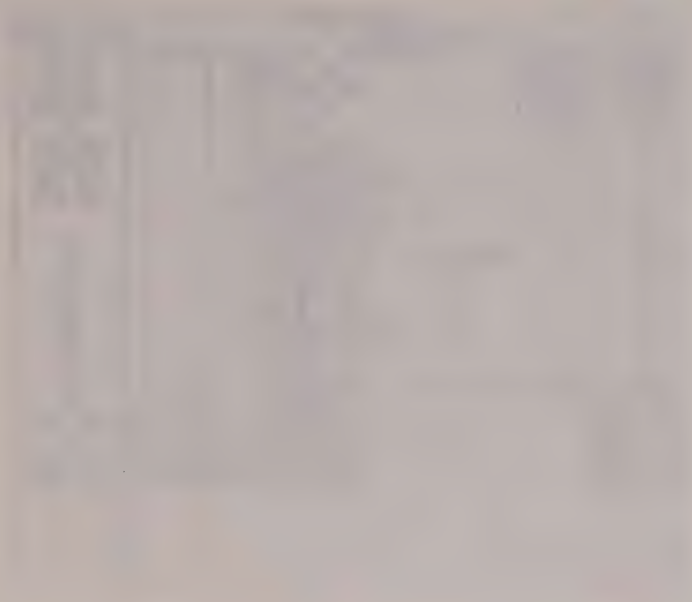
NOTE 6- ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

NOTE 8- SEAL UNGROUNDED ENDS OF SHIELDS USING CLEAR GLYPTAL.

NOTE 9- ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINAL TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

Figure 5-19. Wiring Diagram, Female Board E601





NAVSHIPS 91760

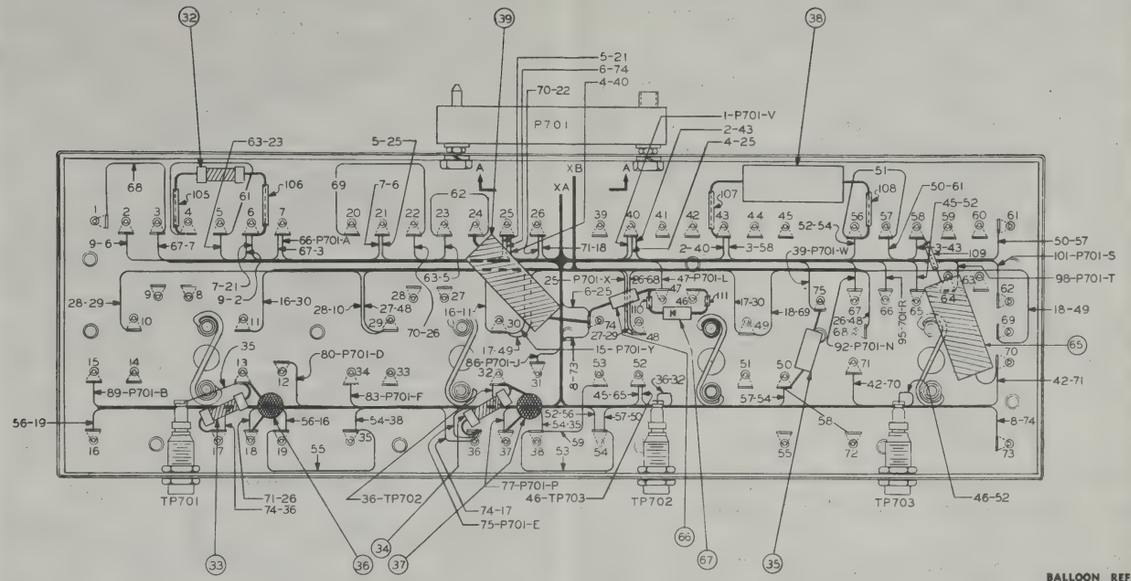
NAVSHIPS 91760

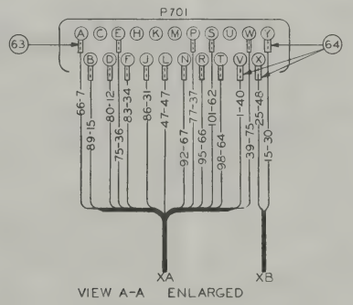
NAVSHIPS 91760

Variations in equipment bearing serial numbers 1 through 495 and 800 through 822.

1. Wire no. 47 is connected to terminal no. 46 instead of terminal no. 47.

2. Resistor R738 (part no. 66) and crystal diode CR705 (part no. 67) are not used.





BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E701

Balloon Reference	Symbol Designation
14	TP703
15	TP702
16	TP701
17	P701
32	R708
33	R709
34	R720
35	R737
36	C704
37	C708
38	C712
39	C714
65	C715
66	C738
67	CR705

WIRE TABLE			
WIRE NO	DESCRIPTION		
1-9	WIRE-WHT-BLK TR SEE NOTE 6	AWG #20	10/010
15-18	- BROWN TR	AWG #20	10/010
25-28	- BLK/BRN TR	AWG #20	10/010
35-36	- BLUE TR	AWG #22	7/010
39	- RED TR		
42	- YELLOW TR		
45-47	- GREEN TR		
50-59	- RED/BLUE TR		
61-63	- YEL/RED TR		
66-71	- GRN/RED TR		
74-75	- BRN/RED TR		
77	- BRN/BLUE TR		
80	- GRN/BRN TR		
83	- BLUE/BRN TR		
86	- GRN/BLK TR		
89	- YELLOW/GRN TR		
92	- RED/BLK TR		
95	- YELLOW/BLK TR		
98	- RED/GRN TR		
101	WIRE-WHT-ORANGE TR	AWG #22	7/010
105-111	SLEEVING-GLASS (BLK)		0.034 ID

NOTE 1- CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2- CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE USING NYLON CORD.

NOTE 4- NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE; THUS 42-70, 42= WIRE NUMBER AND 70= TERMINAL 70 OF CHASSIS AS SHOWN ON THIS DRAWING.

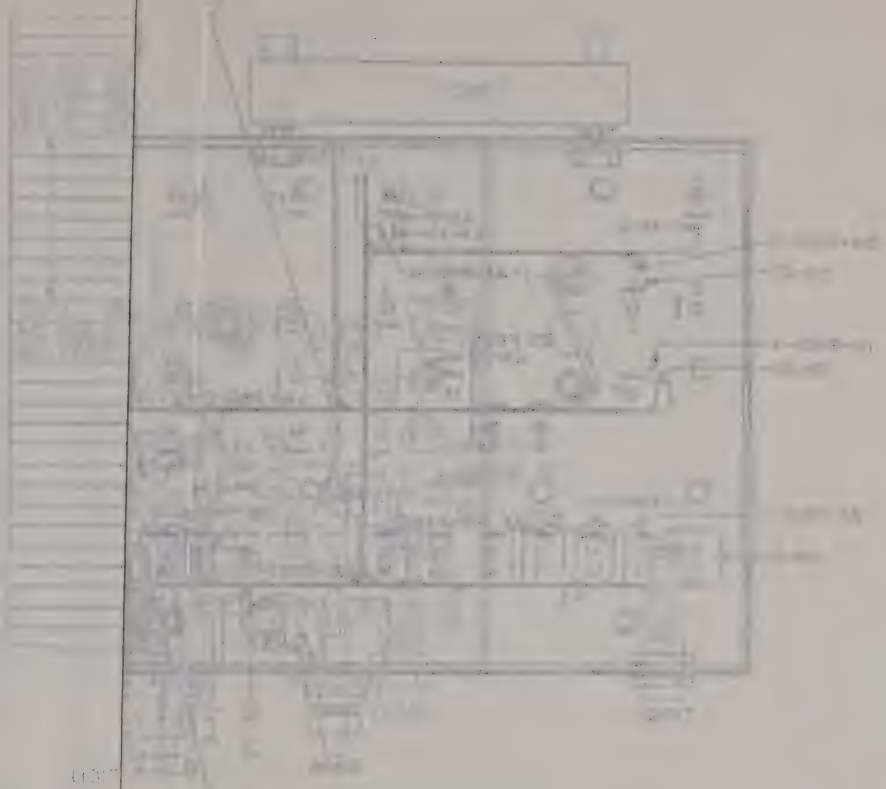
NOTE 5- FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

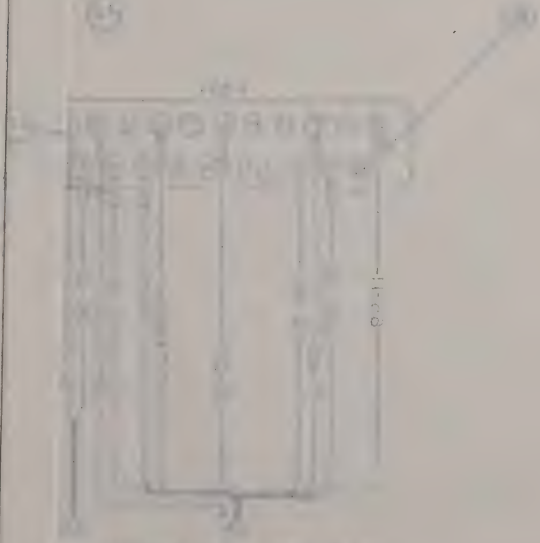
NOTE 6- ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

NOTE 7- ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINAL TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

Figure 5-20. Wiring Diagram, Female Board E701

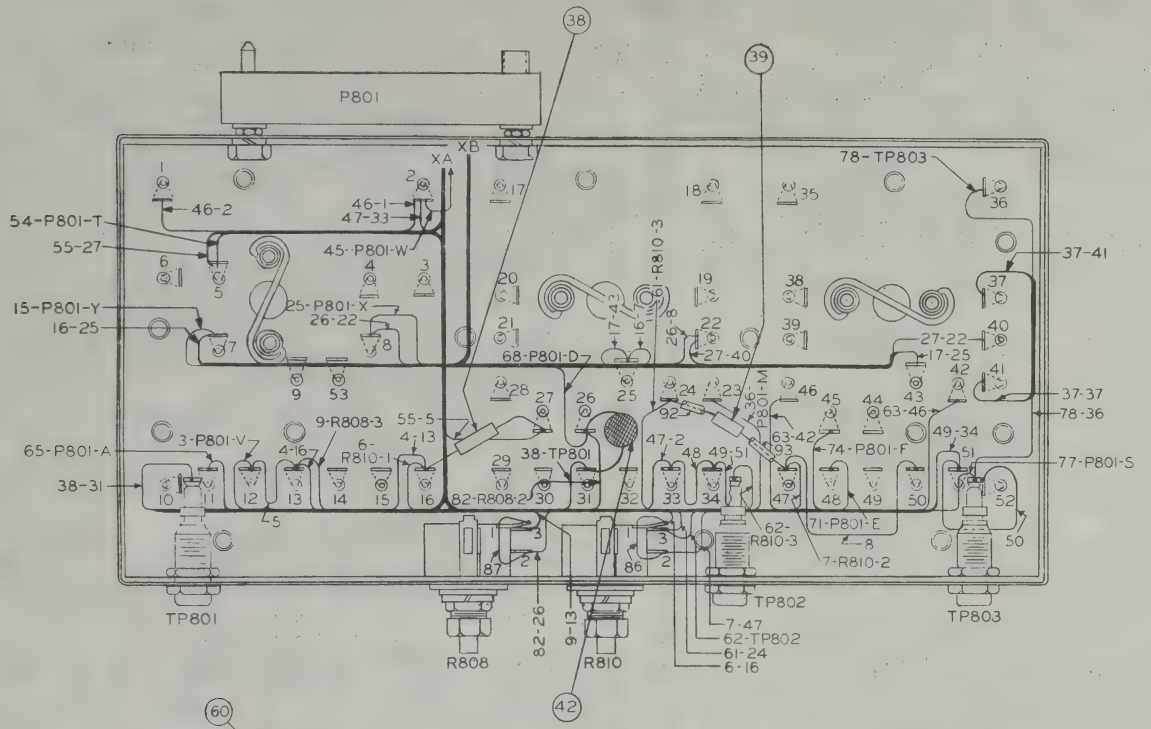
394291 O-56

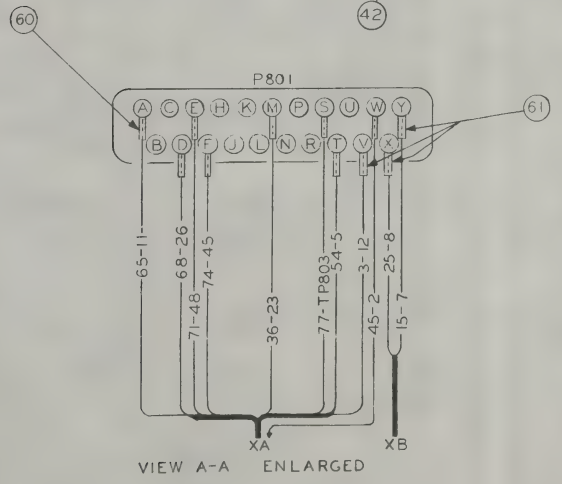




NAVSHIPS 91760
NAVSHIPS 91760

NAVSHIPS 91760





BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E801

Balloon Reference	Symbol Designation
14	R810
15	R808
16	R806
17	TP803
18	TP802
19	TP801
20	P801
38	R818
39	C807
42	C809

WIRE TABLE

WIRE NO	DESCRIPTION		
(3-9)	WIRE-WHT-BLK TR SEE NOTE 6	AWG #20	10/CIC
(15-17)	-BROWN TR	AWG #20	10/010
(25-27)	-BLK/BRN TR.	AWG #20	10/010
(36 38)	-BLUE TR	AWG #22	7/010
(45-50)	-RED TR		
(54-55)	-GREEN TR.		
(61-63)	-YELLOW TR.		
65	-BRN/RED TR		
68	-BRN/GRN TR.		
71	-GRN/BRN TR.		
74	-GRN/BLK TR		
(77-78)	-GRN/RED TR		
82	-WHT-ORANGE TR.	AWG #22	7/010
(86-87)	WIRE-TINNED COPPER		0.020 DIA
(92-93)	SLEEVING-GLASS (BLK)		0.034 DIA

NOTE 1 - CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2 - CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE USING NYLON CORD.

NOTE 4 - NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE; THUS 7-47, 7=WIRE NUMBER, AND 47=TERMINAL 47 OF CHASSIS AS SHOWN ON THIS DRAWING.

NOTE 5 - FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

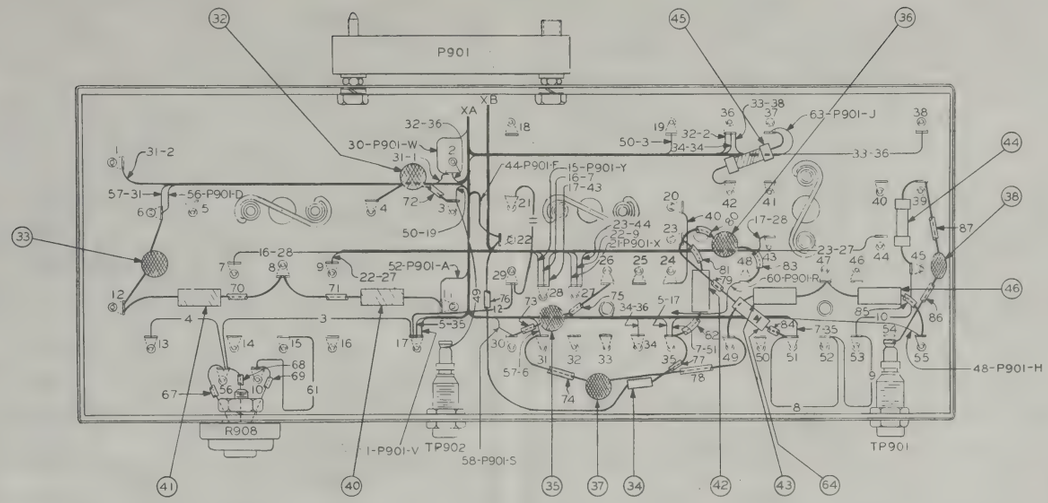
NOTE 6 - ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

NOTE 7 - ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINAL TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

Figure 5-21. Wiring Diagram, Female Board E801

Variations in equipments bearing serial numbers 1 through 400.

1. Wires no. 49 and 60 are included in the XA cable.
2. Wires no. 11 and 12 are not used.
3. Wire no. 44 is connected to terminal no. 33 instead of terminal no. 22.
4. Capacitor C905 (part no. 34) is connected between terminals no. 33 and 35 instead of terminals no. 35 and 22.



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E901

Balloon Reference	Symbol Designation
14	TP901
15	TP902
16	P901
21	R908
32	C903
33	C904
34	C905
35	C907
36	C908
37	C909
38	C911
40	R901
41	R914
42	R919
43	R923
44	R927
45	R929
46	R933
64	CR905

WIRE TABLE			
WIRE NO.	DESCRIPTION		
(1-12)	WIRE-WHT-BLK TR SEE NOTE 6	AWG #20	7/0.10
(15-17)	-BROWN TR	AWG #20	7/0.10
(21-23)	-BLK/BRN TR	AWG #20	7/0.10
26	-BLUE TR	AWG #22	7/0.0
(32-34)	-RED TR		
40	-ORGEN TR		
44	-YELLOW TR		
(48-50)	-GRN/RED TR		
52	-GRN/BLK TR		
(56-58)	-GRN/BRN TR		
(60-61)	-YELLOW/GRN TR		
63	WIRE-WHT-BLUE/BRN TR	AWG #26	7/0.10
(67-87)	SLEEVING GLASS (BLK)		0.034 I.D.

NOTE 1 - CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2 - CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE USING NYLON CORD.

NOTE 3 - NUMBERS IN BALLOONS AND SYMBOL NUMBERS REFER TO LIST OF PART A-8823472.

NOTE 4 - NUMBERS IN WIRES AND AT ENDS OF ARROWS POINTING TO WIRES REFER TO WIRE TABLE. CODING AT ENDS OF WIRES INDICATE WIRE NUMBER AND DESTINATION OF WIRE, THUS 27-9 , 27=WIRE NUMBER AND 9 = TERMINAL 9 OF CHASSIS AS SHOWN ON THIS DRAWING.

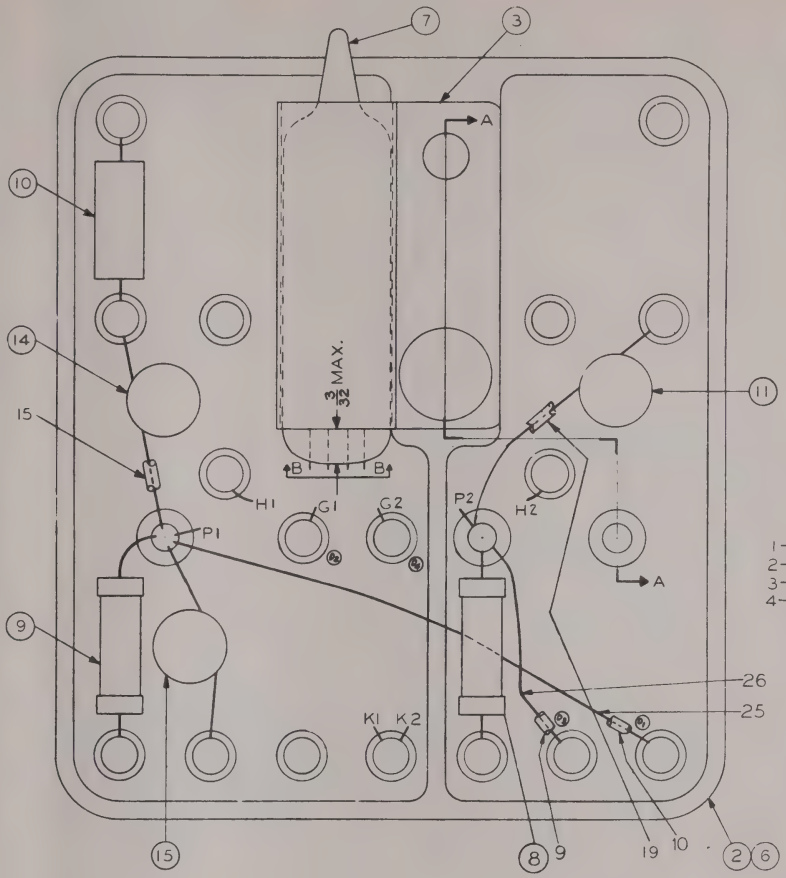
NOTE 5 - FOR CODING AT CABLE BREAKS (XA AND XB) SEE CHASSIS AND VIEW A-A.

NOTE 6 - ALL COLOR CODED WIRE IS 300 VOLT VINYL INSULATION WITH NYLON COMPOUND JACKET.

NOTE 7 - ALLOW SUFFICIENT SLACK ON EACH WIRE END TO PERMIT CHASSIS TERMINALS TO FLOAT AND TO MAKE ANOTHER CONNECTION IN CASE OF WIRE BREAK.

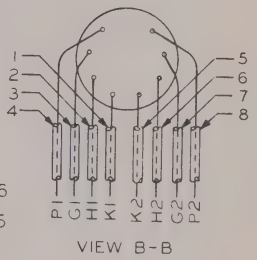
Figure 5-22. Wiring Diagram, Female Board E901

394291 O - 56



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E102

Balloon Reference	Symbol Designation
7	V101
8	R106
9	R107
10	R113
11	C101
14	C104
15	C105



VIEW B-B

WIRE TABLE	
WIRE NO.	DESCRIPTION
1-10	SLEEVING-GLASS (BLK) .022 I.D.
15&19	SLEEVING-GLASS (BLK) .034 I.D.
25-26	WIRE-TINNED COPPER .020 DIA.

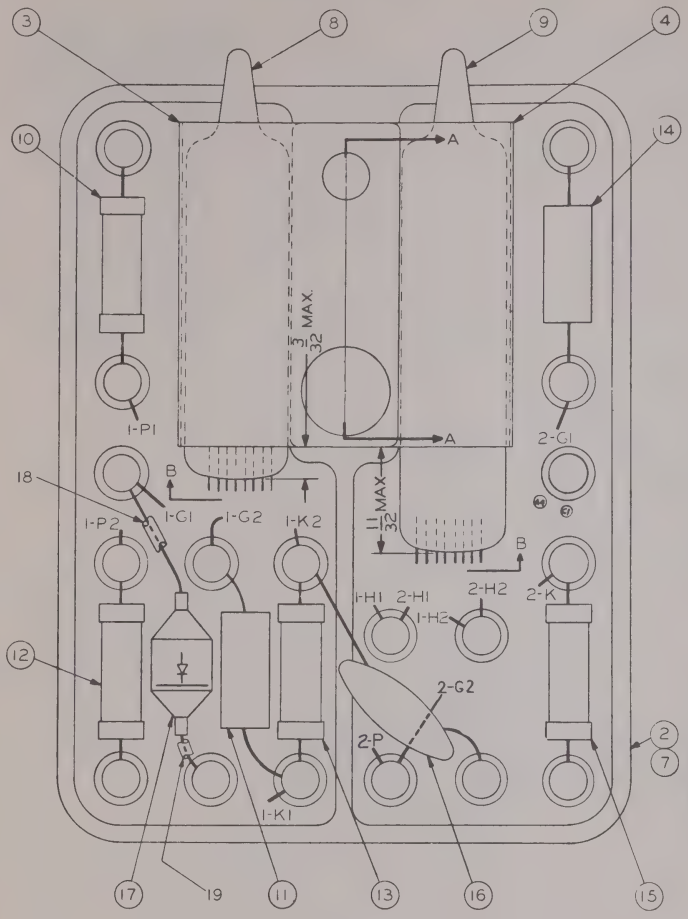
NOTE-1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE-2 NUMBERS AT ENDS OF ARROWS REFER TO WIRE TABLE.

NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.

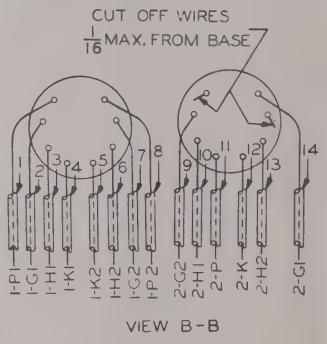
Figure 5-23. Wiring Diagram, Male Board 8823450-501 (E102)

394291 O-56-5



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E103

Balloon Reference	Symbol Designation
8	V102
9	V103
10	R114
11	R115
12	R116
13	R117
14	R120
15	R121
16	C108
17	CR101



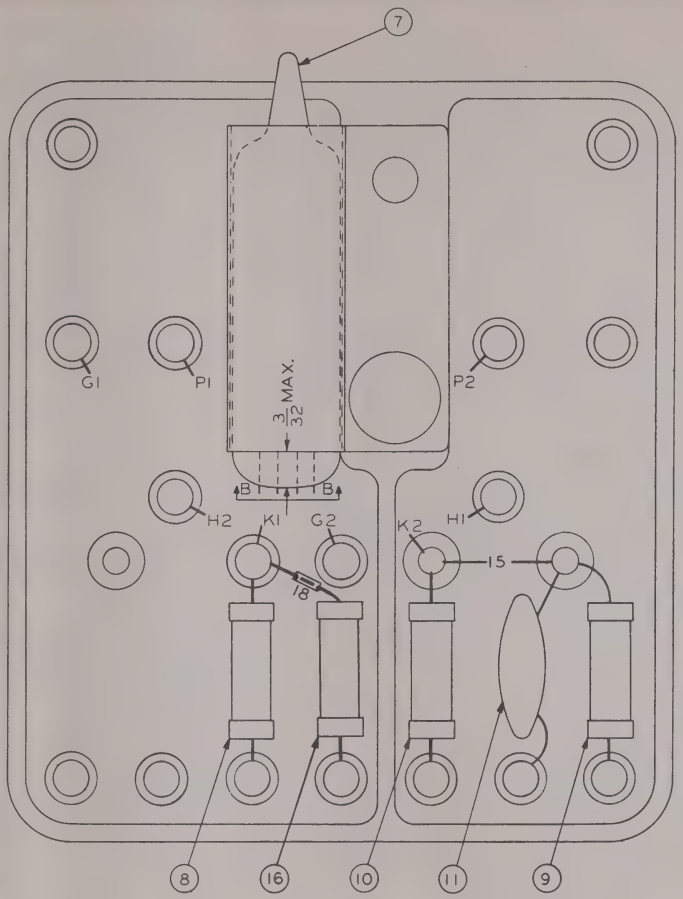
WIRE TABLE	
WIRE NO	DESCRIPTION
1-14	SLEEVING - GLASS (BLK) .022 I.D.
18-19	SLEEVING - GLASS (BLK) .034 I.D.

NOTE - 1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE - 2 NUMBERS AT ENDS OF ARROWS REFER TO WIRE TABLE.

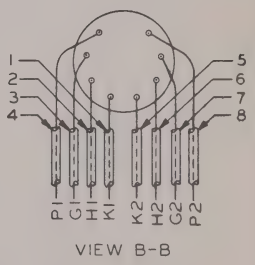
NOTE - 3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEMS 8 AND 9.

Figure 5-24. Wiring Diagram, Male Board 8823451-501 (E103)



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E104

Balloon Reference	Symbol Designation
7	V104
8	R123
9	R125
10	R128
11	C113
16	R124



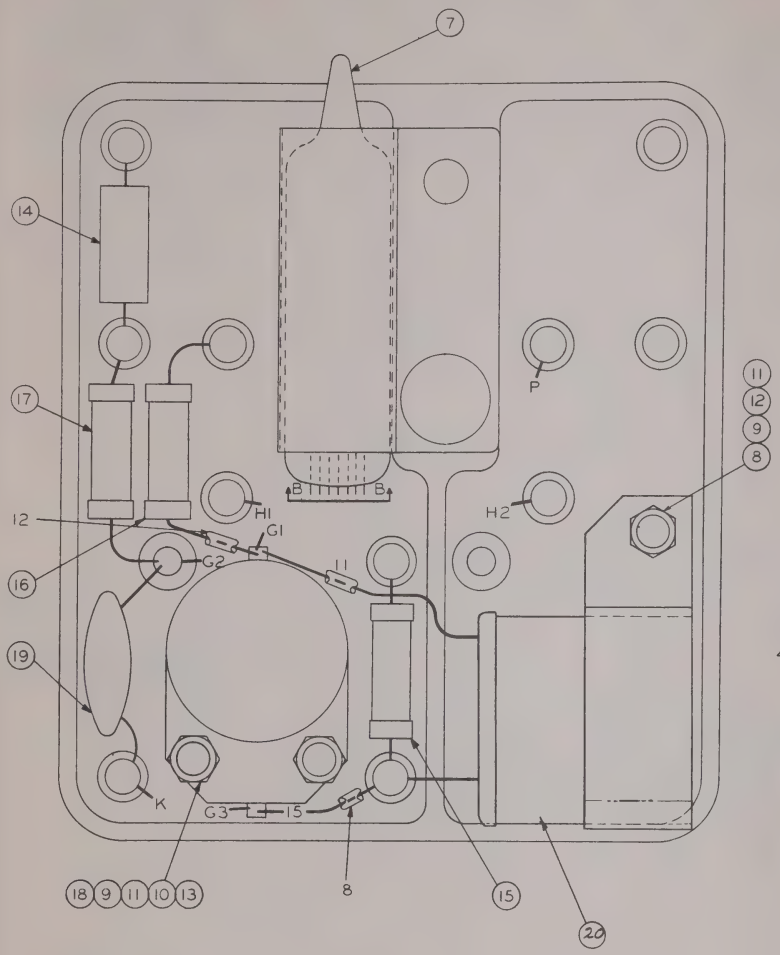
WIRE TABLE	
WIRE NO.	DESCRIPTION
1-8	SLEEVING-GLASS (BLK) .022 I.D.
15	WIRE-TINNED COPPER 0.020 DIA.
18	SLEEVING GLASS (BLK) .034 DIA.

NOTE-1 CRIMP AND SOLDER ALL FI ECTRICAL CONNECTIONS

NOTE-2 NUMBERS IN WIRES AND NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

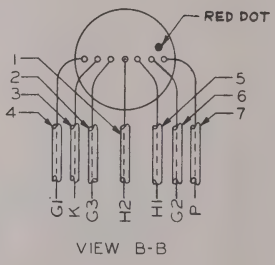
NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.

Figure 5-25. Wiring Diagram, Male Board 8823452-501 (E104)



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E202

Balloon Reference	Symbol Designation
7	V201
14	R201
15	R202
16	R203
17	R204
18	C202
19	C204
20	Y201



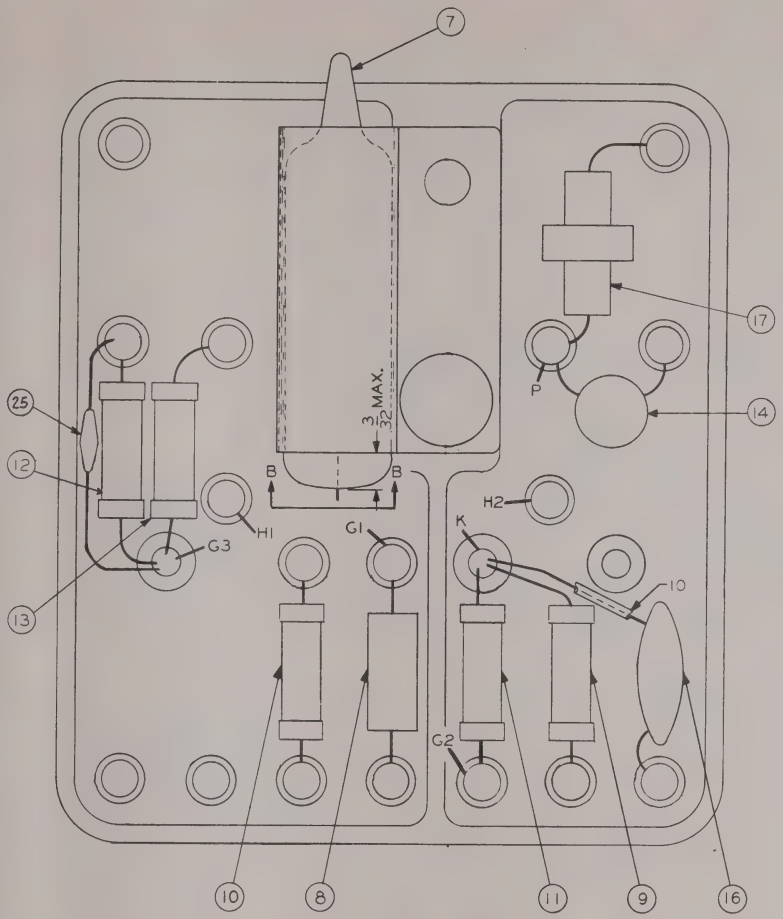
WIRE TABLE		
WIRE NO.	DESCRIPTION	
1-8	SLEEVING-GLASS (BLK)	.022 I.D.
11-12	SLEEVING-GLASS (BLK)	.034 I.D.
15	WIRE-TINNED COPPER	.020 DIA.

NOTE-1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE-2 NUMBERS IN WIRES AND NUMBERS AT ENDS OF ARROWS REFER TO WIRE TABLE.

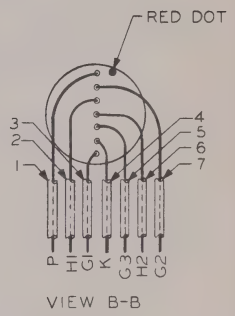
NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.

Figure 5-26. Wiring Diagram, Male Board 8824392-501 (E202)



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E203

Balloon Reference	Symbol Designation
7	V202
8	R205
9	R206
10	R207
11	R208
12	R209
13	R210
14	C206
16	C209
17	L202



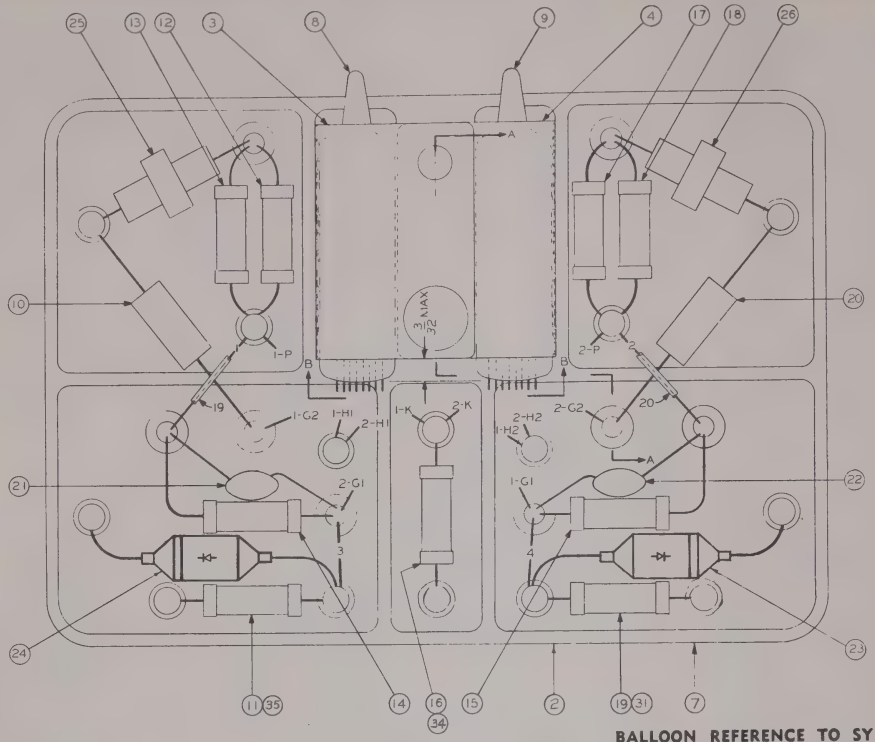
WIRE TABLE		
WIRE NO.	DESCRIPTION	
1-7	SLEEVING-GLASS (BLK)	.022 I.D.
10	SLEEVING-GLASS (BLK)	.034 I.D.

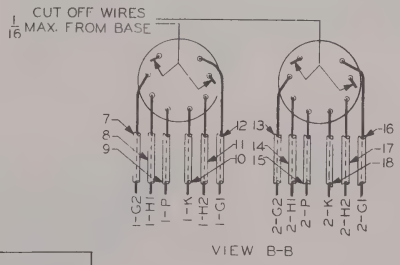
NOTE-1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE-2 NUMBERS AT ENDS OF ARROWS REFER TO WIRE TABLE.

NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.

Figure 5-27. Wiring Diagram, Male Board 8823047-501 (E203)





VIEW B-B

WIRE TABLE	
WIRE NO.	DESCRIPTION
1-4	WIRE-TINNED COPPER .020 DIA
7-20	SLEEVING-GLASS (BLK) .022 I.D.

NOTE - 1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE - 2 NUMBERS IN WIRES AND NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

NOTE - 3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEMS 8 AND 9.

BALLOON REFERENCE TO SYMBOL DESIGNATION CHART

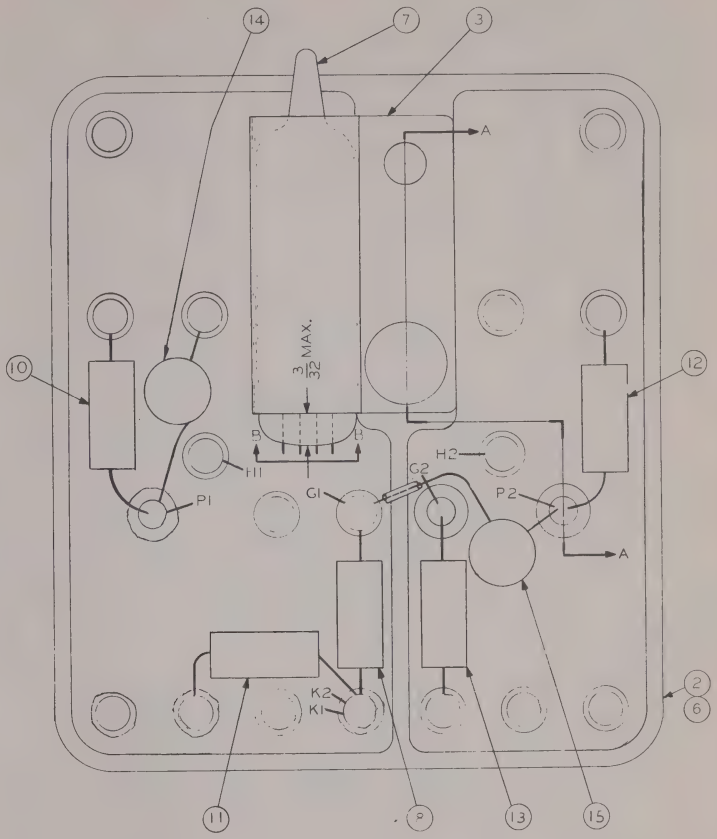
Balloon Reference	Symbol Designation		
	E302	E303	E902
8	V301	V303	V902
9	V302	V304	V901
10	R302	R316	R912
11	R303	R317	—
12	R304	R318	R910
13	R305	R319	R911
14	R306	R320	R909
15	R308	R322	R906
16	R309	R323	—
17	R311	R325	R904
18	R312	R326	R905
19	R313	R327	—
20	R314	R328	R902
21	C302	C308	C902
22	C304	C310	C901
23	CR301	CR303	CR902
24	CR302	CR304	CR901
25	L301	L303	L902
26	L302	L304	L901
31	—	—	R913
34	—	—	R907
35	—	—	R903

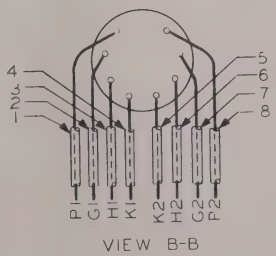
NOTE: Boards E302 and E303 are identical and interchangeable.

Figure 5-28. Wiring Diagram, Male Boards 8823040-501, -502 (E302, E303, E902)

BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E704

Balloon Reference	Symbol Designation
7	V703
8	R724
10	R726
11	R727
12	R728
13	R729
14	C709
15	C710





VIEW B-B

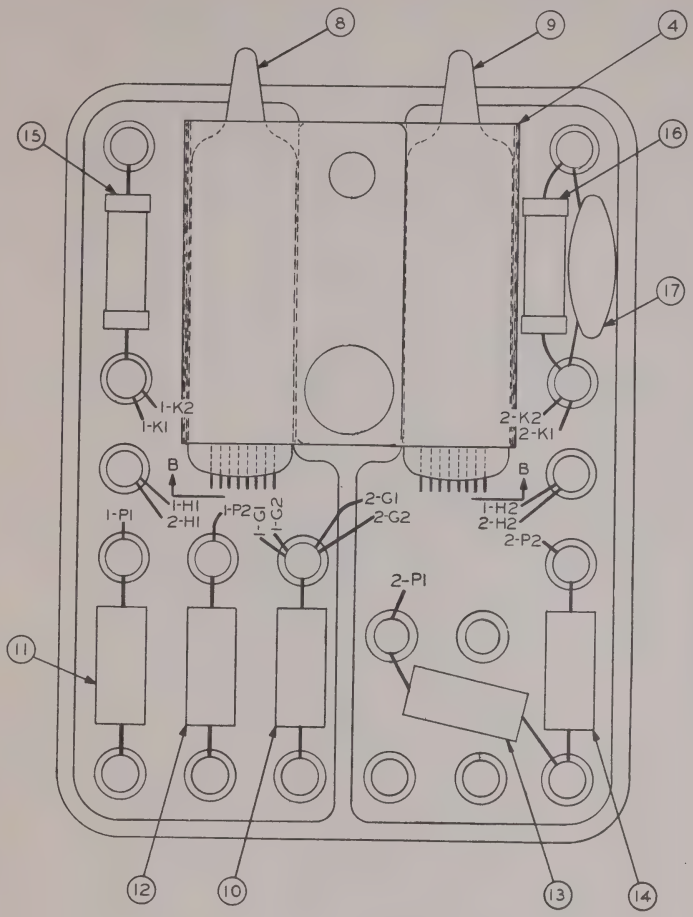
WIRE TABLE	
WIRE NO.	DESCRIPTION
(1-8)	SLEEVING-GLASS (BLK) .022 I.D.
10	SLEEVING-GLASS (BLK) 034 I.D.

NOTE 1 -CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2 NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

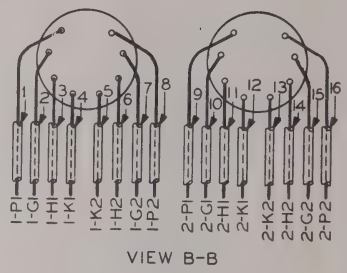
NOTE 3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.

Figure 5-29. Wiring Diagram, Male Board 8823023-501 (E704)



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E705

Balloon Reference	Symbol Designation
8	V704
9	V705
10	R730
11	R731
12	R732
13	R733
14	R734
15	R735
16	R736
17	C711



VIEW B-B

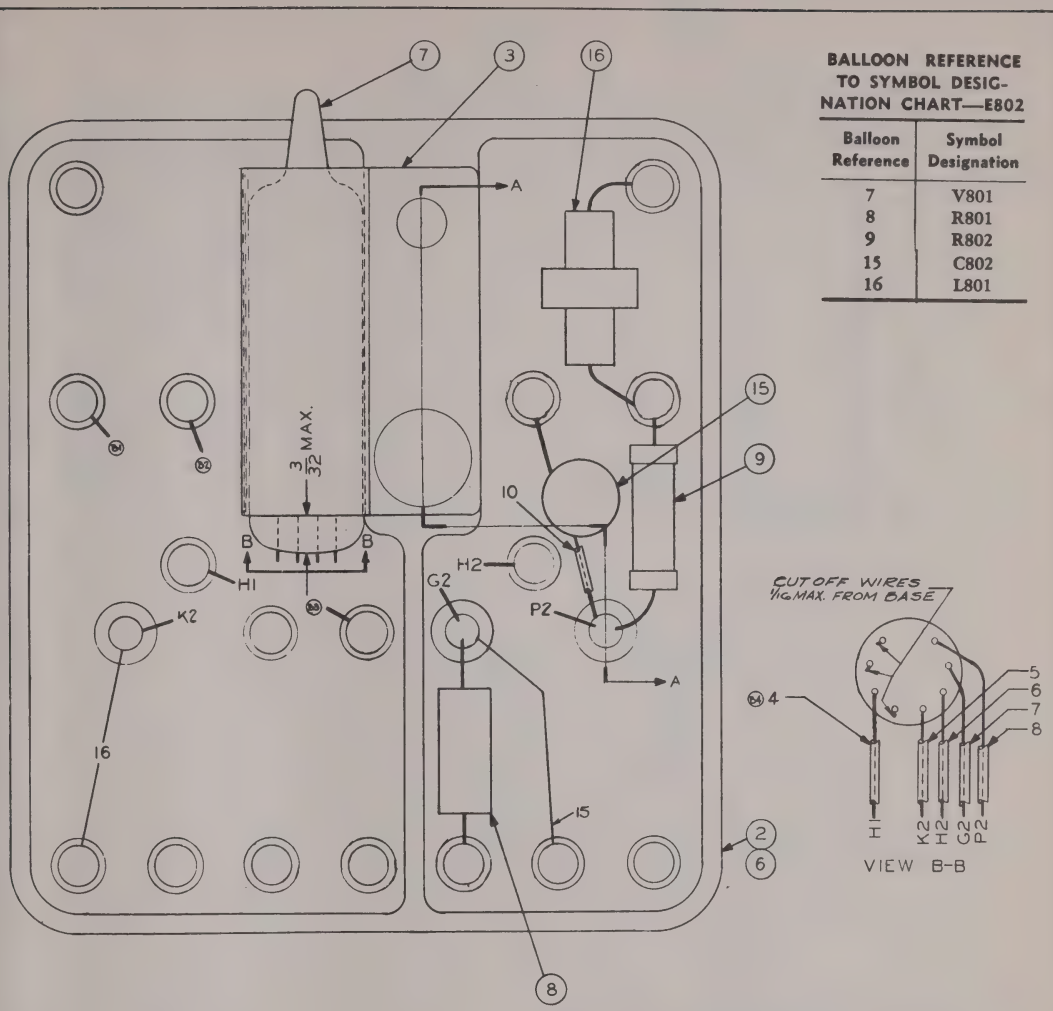
WIRE TABLE	
WIRE NO	DESCRIPTION
1-16	SLEEVING-GLASS (BLK) .022 I.D.

NOTE-1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE-2 NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEMS 8 AND 9.

Figure 5-30. Wiring Diagram, Male Board 8823035-501 (E705)



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E802

Balloon Reference	Symbol Designation
7	V801
8	R801
9	R802
15	C802
16	L801

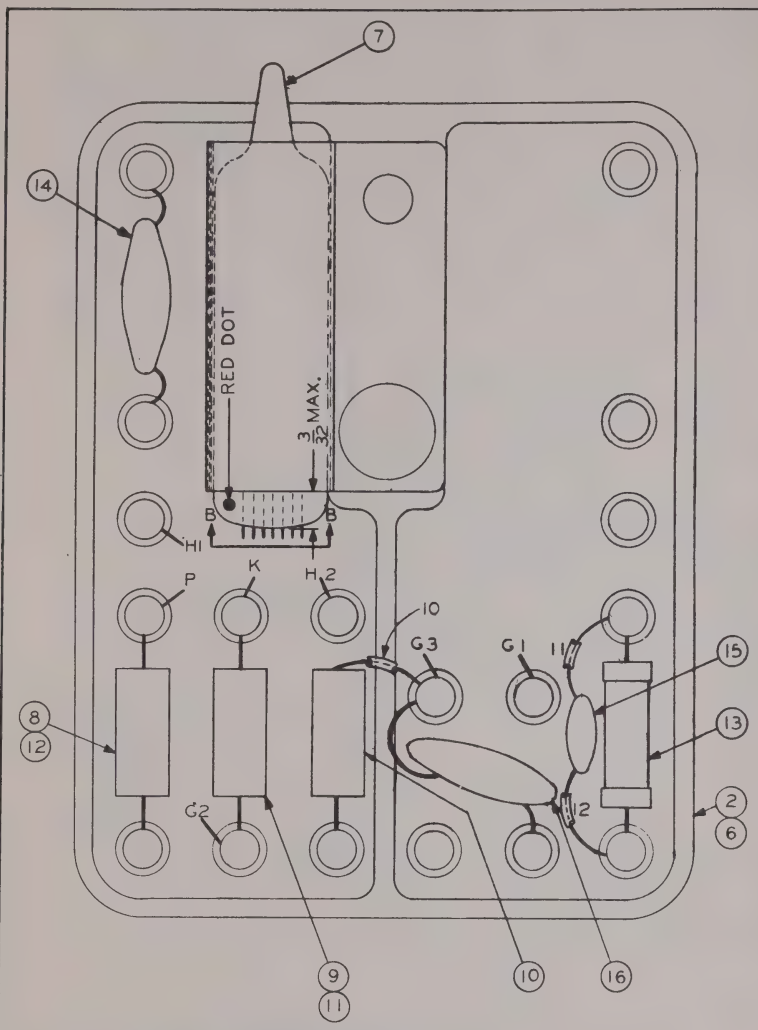
WIRE TABLE	
WIRE NO.	DESCRIPTION
(4-8)	SLEEVING-GLASS (BLK) .022 I.D.
10	SLEEVING-GLASS (BLK) .034 I.D.
15	WIRE-TINNED COPPER .020 DIA.

NOTE 1 -CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE 2 NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

NOTE 3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.

Figure 5-31. Wiring Diagram, Male Board 8823446-501 (E802)



BALLOON REFERENCE TO SYMBOL DESIGNATION CHART

Balloon Reference	Symbol Designation E803	Symbol Designation E804
7	V802	V803
8	R809	—
9	R811	—
10	—	R812
11	—	R813
12	—	R814
13	—	R815
14	—	C803
15	—	C804
16	—	C806

WIRE TABLE	
WIRE NO.	DESCRIPTION
(1-7)	SLEEVING-GLASS (BLK) .022 I.D.
(10-12)	SLEEVING-GLASS (BLK) .034 I.D.

NOTE-1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE-2 NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.

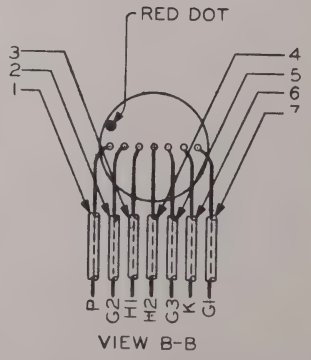
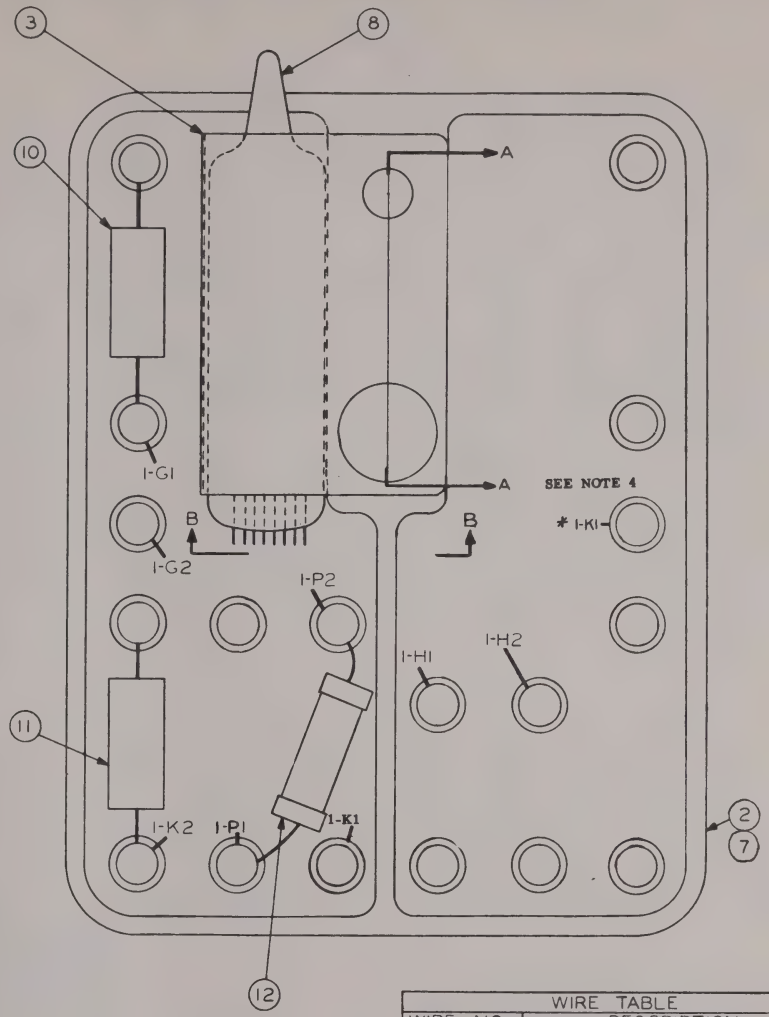


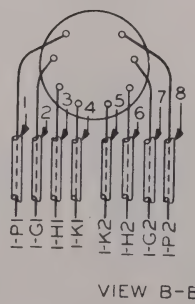
Figure 5-32. Wiring Diagram, Male Boards 8823026-501, -502 (E803, E804)



WIRE TABLE	
WIRE NO.	DESCRIPTION
1-8	SLEEVING-GLASS (BLK) .022 I.D.

BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E903

Balloon Reference	Symbol Designation
8	V903
10	R915
11	R916
12	R917



VIEW B-B

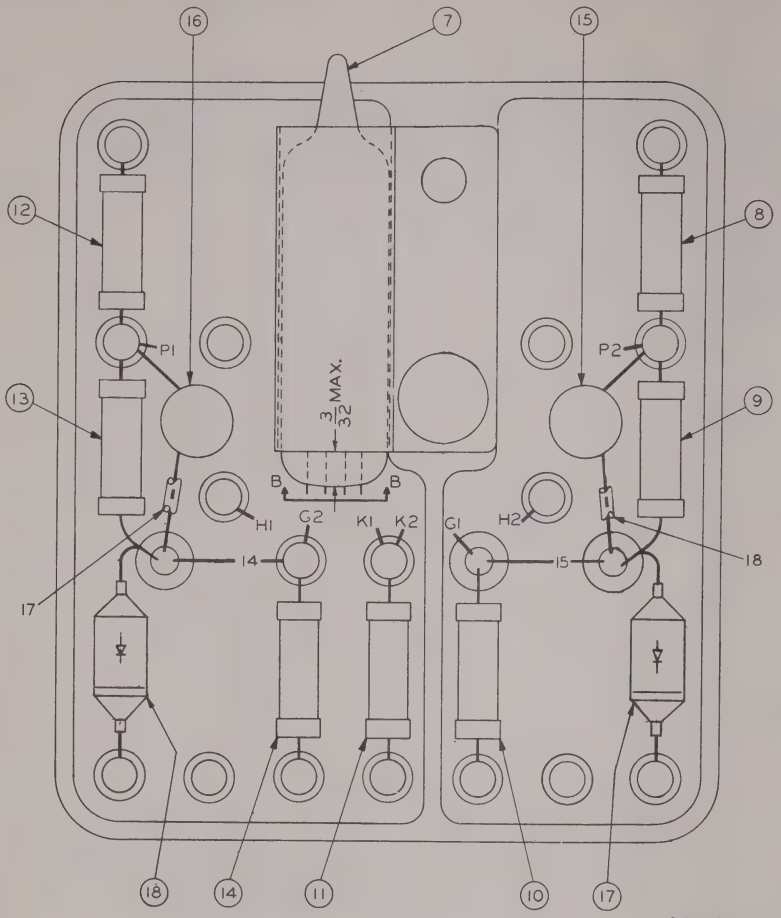
NOTE - 1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE - 2 NUMBERS AT ENDS OF ARROWS REFER TO WIRE TABLE

NOTE - 3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 8

NOTE - 4 *1-K1 LOCATION ON EQUIPMENTS W/ SERIAL NO. ABOVE 400. OTHER LOCATION FOR EQUIPMENTS 1 THROUGH 400.

Figure 5-33. Wiring Diagram, Male Board 8824393-501 (E903)

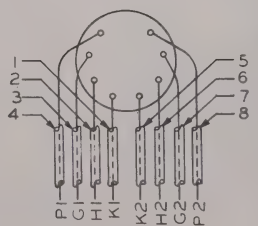


WIRE TABLE	
WIRE NO	DESCRIPTION
1-8	SLEEVING-GLASS (BLK) .022 I.D.
14-15	WIRE-TINNED COPPER .020 DIA.
17-18	SLEEVING-GLASS (BLK) .034 I.D.

NOTE-1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE-2 NUMBERS IN WIRES AND NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.



VIEW B-B

BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E904

Balloon Reference	Symbol Designation
7	V905
8	R924
9	R925
10	R926
11	R928
12	R930
13	R931
14	R932
15	C910
16	C912
17	CR903
18	CR904

Figure 5-34. Wiring Diagram, Male Board 8824394-501 (E904)

BALLOON REFERENCE TO SYMBOL DESIGNATION CHART

SYMBOL DESIGNATIONS													
402	E403	E404	E405	E502	E503	E504	E505	E602	E603	E604	E605	E702	E703
401	V402	V403	V404	V501	V502	V503	V504	V601	V602	V603	V604	V701	V702
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
402	R412	R423	R434	R502	R513	R524	R535	R602	R613	R624	R635	R701	R713
403	R413	R424	R436	R504	R514	R525	R537	R603	R614	R625	R636	R702	R714
404	R414	R425	R437	R505	R515	R526	R538	R604	R615	R626	R637	R703	R715
405	R415	R426	R438	R506	R516	R527	R539	R605	R616	R627	R638	R704	R716
406	R417	R428	R439	R507	R518	R529	R540	R606	R618	R629	R639	R705	R717
407	R418	R429	R440	R508	R519	R530	R541	R607	R619	R630	R640	R706	R718
408	R419	R430	R441	R509	R520	R531	R542	R608	R620	R631	R641	R707	R719
409	R420	R431	R442	R510	R521	R532	R543	R610	R621	R632	R643	R710	R721
410	R421	R432	R443	R511	R522	R533	R544	R611	R622	R633	R644	R711	R722
411	R422	R433	R444	R512	R523	R534	R545	R612	R623	R634	R645	R712	R723
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
403	(1)	—	—	—	—	—	—	(2)	—	—	—	(3)	—
407	(1)	—	—	—	—	—	—	(2)	—	—	—	(3)	—
—	(1)	C413	C419	C502	C508	C513	C518	(2)	C607	C612	C617	(3)	C705
405	C410	C415	C423	C504	C510	C515	C522	C604	C609	C614	C621	C702	C706
—	(1)	C417	C426	C506	C511	C516	C523	(2)	C610	C615	C622	(3)	C707
R401	CR404	CR407	CR409	CR501	CR504	CR507	CR509	CR601	CR604	CR607	CR609	CR701	CR703
R402	CR405	CR408	CR410	CR502	CR505	CR508	CR510	CR602	CR605	CR608	CR610	CR702	CR704

serial no. 1198 and above.
E204, E402, E403, E602, and E702, the boards in this
l and interchangeable. Boards E402, E403, E602, and
al and interchangeable.

serial no. 1 through 1197.
E204 and E402 the boards in this chart are identical
ble.

3 for equipments w/ serial no. 1198 and above.
rence 23 refers to capacitor C408.
rence 24 refers to capacitor C412.
rences 25 and 27 will be vacant.

s w/ serial no. 1 through 1197.
rences 23 and 24 will be vacant.
erence 25 refers to capacitor C408.
erence 27 refers to capacitor C412.

(2) On board E602 for equipments w/ serial no. 1198 and above.
Balloon reference 23 refers to capacitor C602.
Balloon reference 24 refers to capacitor C605.
Balloon references 25 and 27 will be vacant.

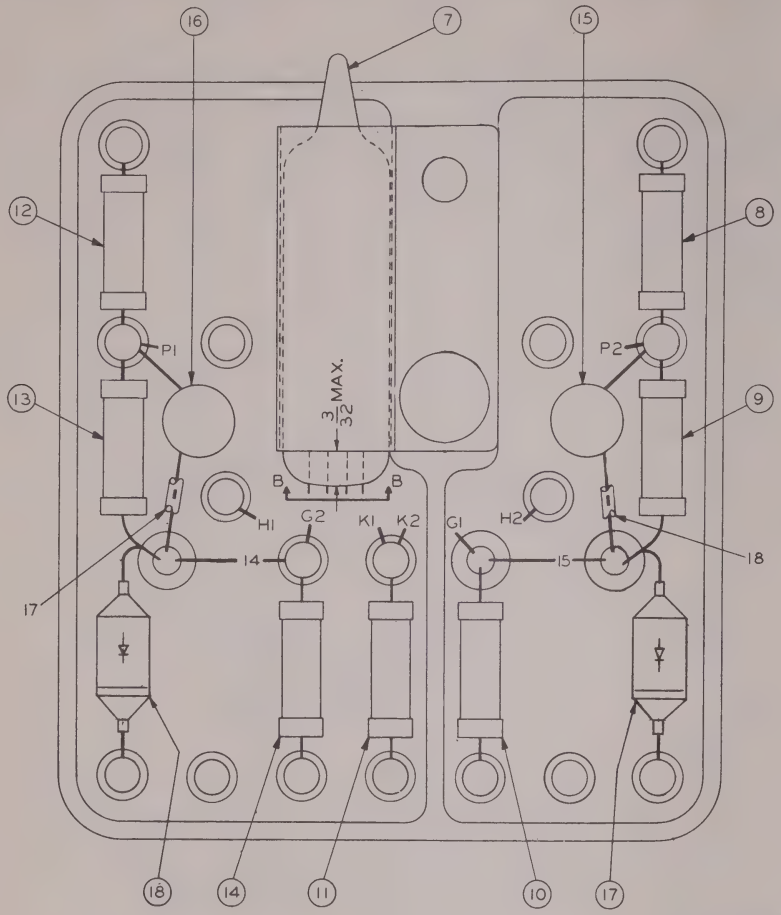
For equipments w/ serial no. 1 through 1197.
Balloon references 23 and 24 will be vacant.
Balloon reference 25 refers to capacitor C602.
Balloon reference 27 refers to capacitor C605.

(3) On board E702 for equipments w/ serial no. 1198 and above
Balloon reference 23 refers to capacitor C701.
Balloon reference 24 refers to capacitor C703.
Balloon references 25 and 27 will be vacant.

For equipments w/ serial no. 1 through 1197.
Balloon references 23 and 24 will be vacant.
Balloon reference 25 refers to capacitor C701.
Balloon reference 27 refers to capacitor C703.

Figure 5-35. Wiring Diagram, Male Boards 8823019-501, -502, -503

394291 O - 56

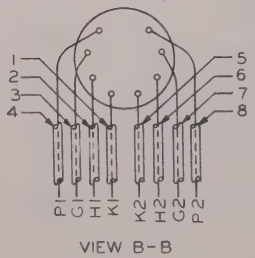


WIRE TABLE	
WIRE. NO	DESCRIPTION
1-8	SLEEVING-GLASS (BLK) .022 I.D.
14-15	WIRE-TINNED COPPER .020 DIA.
17-18	SLEEVING-GLASS (BLK) .034 I.D.

NOTE-1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE-2 NUMBERS IN WIRES AND NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.



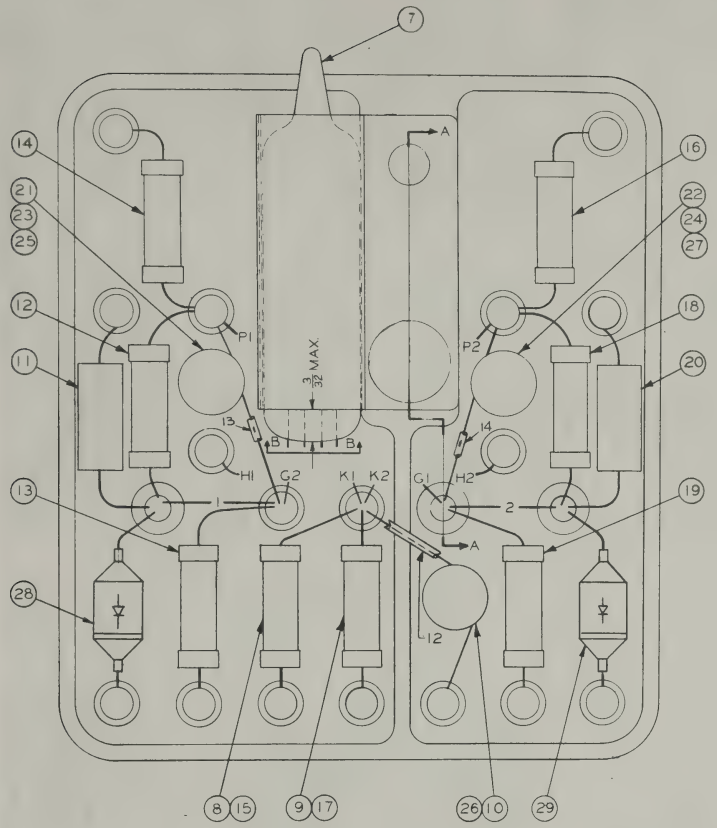
VIEW B-B

BALLOON REFERENCE TO SYMBOL DESIGNATION CHART—E904

Balloon Reference	Symbol Designation
7	V905
8	R924
9	R925
10	R926
11	R928
12	R930
13	R931
14	R932
15	C910
16	C912
17	CR903
18	CR904

Figure 5-34. Wiring Diagram, Male Board 8824394-501 (E904)

NAVSHIPS 91760

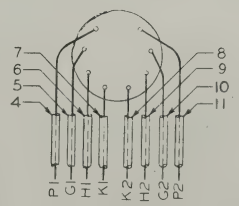


WIRE TABLE	
WIRE NO.	DESCRIPTION
1-2	WIRE-TINNED COPPER .020 DIA
4-14	SLEEVING-GLASS (BLK) .022 I.D.

NOTE-1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS

NOTE-2 NUMBER IN WIRES AND NUMBERS AT ENDS OF ARROWS IN VIEW B-B REFER TO WIRE TABLE.

NOTE-3 CODING AT ENDS OF WIRES INDICATES DESTINATION FROM ITEM 7.



VIEW B-B

BALLOON REFERENCE TO SYMBOL DESIGNATION CHART

BALLOON REFERENCE	SYMBOL DESIGNATIONS														
	E204	E402	E403	E404	E405	E502	E503	E504	E505	E602	E603	E604	E605	E702	E703
7	V203	V401	V402	V403	V404	V501	V502	V503	V504	V601	V602	V603	V604	V701	V702
8	R217	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9	R215	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	R214	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11	—	R402	R412	R423	R434	R502	R513	R524	R535	R602	R613	R624	R635	R701	R713
12	R218	R403	R413	R424	R436	R504	R514	R525	R537	R603	R614	R625	R636	R702	R714
13	R219	R404	R414	R425	R437	R505	R515	R526	R538	R604	R615	R626	R637	R703	R715
14	R216	R405	R415	R426	R438	R506	R516	R527	R539	R605	R616	R627	R638	R704	R716
15	—	R406	R417	R428	R439	R507	R518	R529	R540	R606	R618	R629	R639	R705	R717
16	R213	R407	R418	R429	R440	R508	R519	R530	R541	R607	R619	R630	R640	R706	R718
17	—	R408	R419	R430	R441	R509	R520	R531	R542	R608	R620	R631	R641	R707	R719
18	R211	R409	R420	R431	R442	R510	R521	R532	R543	R610	R621	R632	R643	R710	R721
19	R212	R410	R421	R432	R443	R511	R522	R533	R544	R611	R622	R633	R644	R711	R722
20	—	R411	R422	R433	R444	R512	R523	R534	R545	R612	R623	R634	R645	R712	R723
21	C211	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	C210	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23	—	C403	(1)	—	—	—	—	—	—	(2)	—	—	—	(3)	—
24	—	C407	(1)	—	—	—	—	—	—	(2)	—	—	—	(3)	—
25	—	—	(1)	C413	C419	C502	C508	C513	C518	(2)	C607	C612	C617	(3)	C705
26	—	C405	C410	C415	C423	C504	C510	C515	C522	C604	C609	C614	C621	C702	C706
27	—	—	(1)	C417	C426	C506	C511	C516	C523	(2)	C610	C615	C622	(3)	C707
28	CR202	CR401	CR404	CR407	CR409	CR501	CR504	CR507	CR509	CR601	CR604	CR607	CR609	CR701	CR703
29	CR201	CR402	CR405	CR408	CR410	CR502	CR505	CR508	CR510	CR602	CR605	CR608	CR610	CR702	CR704

NOTES:

On equipments w/ serial no. 1198 and above.
Excepting boards E204, E402, E403, E602, and E702, the boards in this chart are identical and interchangeable. Boards E402, E403, E602, and E702 are identical and interchangeable.

On equipments w/ serial no. 1 through 1197.
Excepting boards E204 and E402 the boards in this chart are identical and interchangeable.

(1) **On board E403 for equipments w/ serial no. 1198 and above.**
Balloon reference 23 refers to capacitor C408.
Balloon reference 24 refers to capacitor C412.
Balloon references 25 and 27 will be vacant.

For equipments w/ serial no. 1 through 1197.
Balloon references 23 and 24 will be vacant.
Balloon reference 25 refers to capacitor C408.
Balloon reference 27 refers to capacitor C412.

(2) **On board E602 for equipments w/ serial no. 1198 and above.**
Balloon reference 23 refers to capacitor C602.
Balloon reference 24 refers to capacitor C605.
Balloon references 25 and 27 will be vacant.

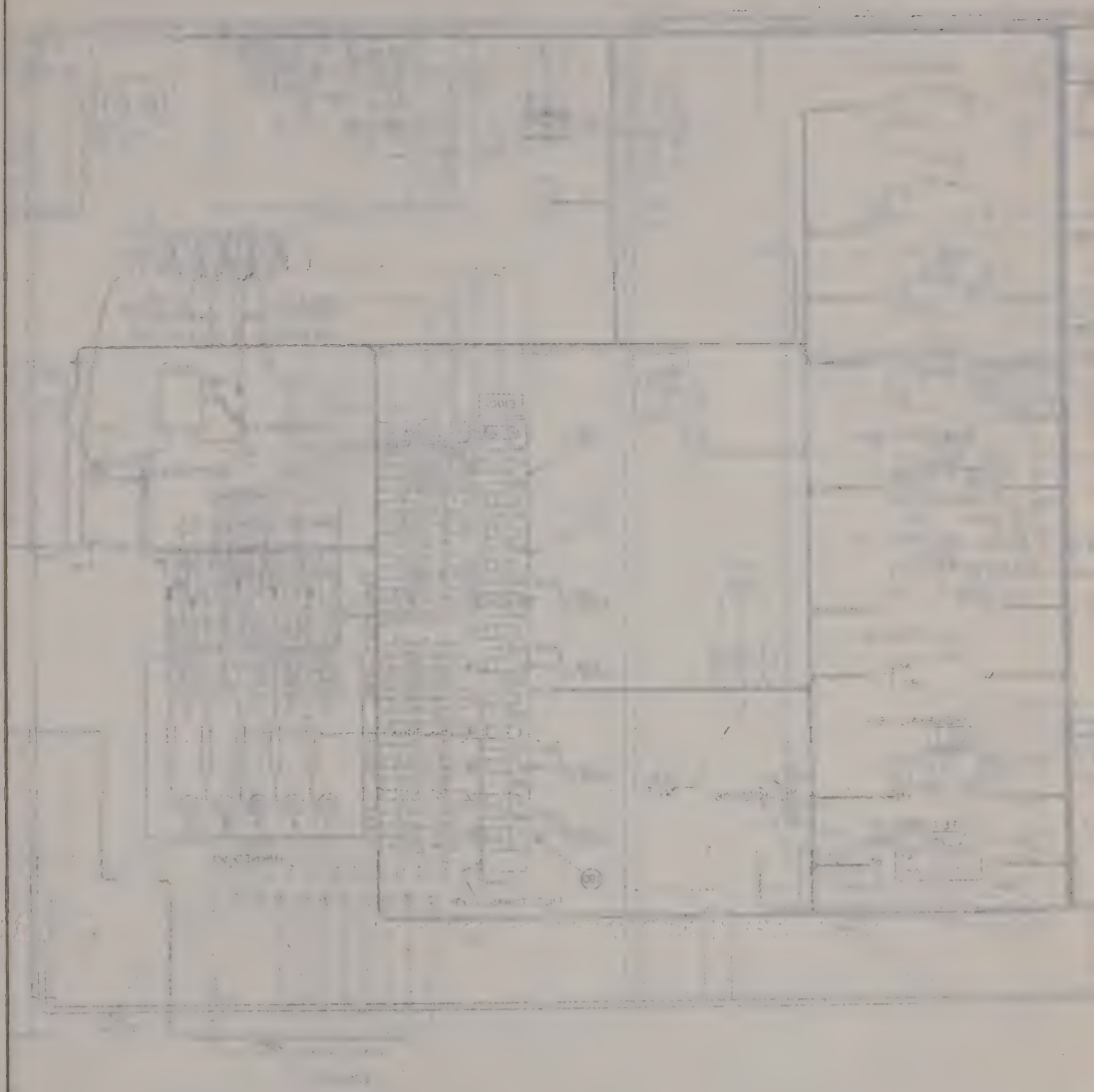
For equipments w/ serial no. 1 through 1197.
Balloon references 23 and 24 will be vacant.
Balloon reference 25 refers to capacitor C602.
Balloon reference 27 refers to capacitor C605.

(3) **On board E702 for equipments w/ serial no. 1198 and above**
Balloon reference 23 refers to capacitor C701.
Balloon reference 24 refers to capacitor C703.
Balloon references 25 and 27 will be vacant.

For equipments w/ serial no. 1 through 1197.
Balloon references 23 and 24 will be vacant.
Balloon reference 25 refers to capacitor C701.
Balloon reference 27 refers to capacitor C703.

Figure 5-35. Wiring Diagram, Male Boards 8823019-501, -502, -503

394291 O - 56



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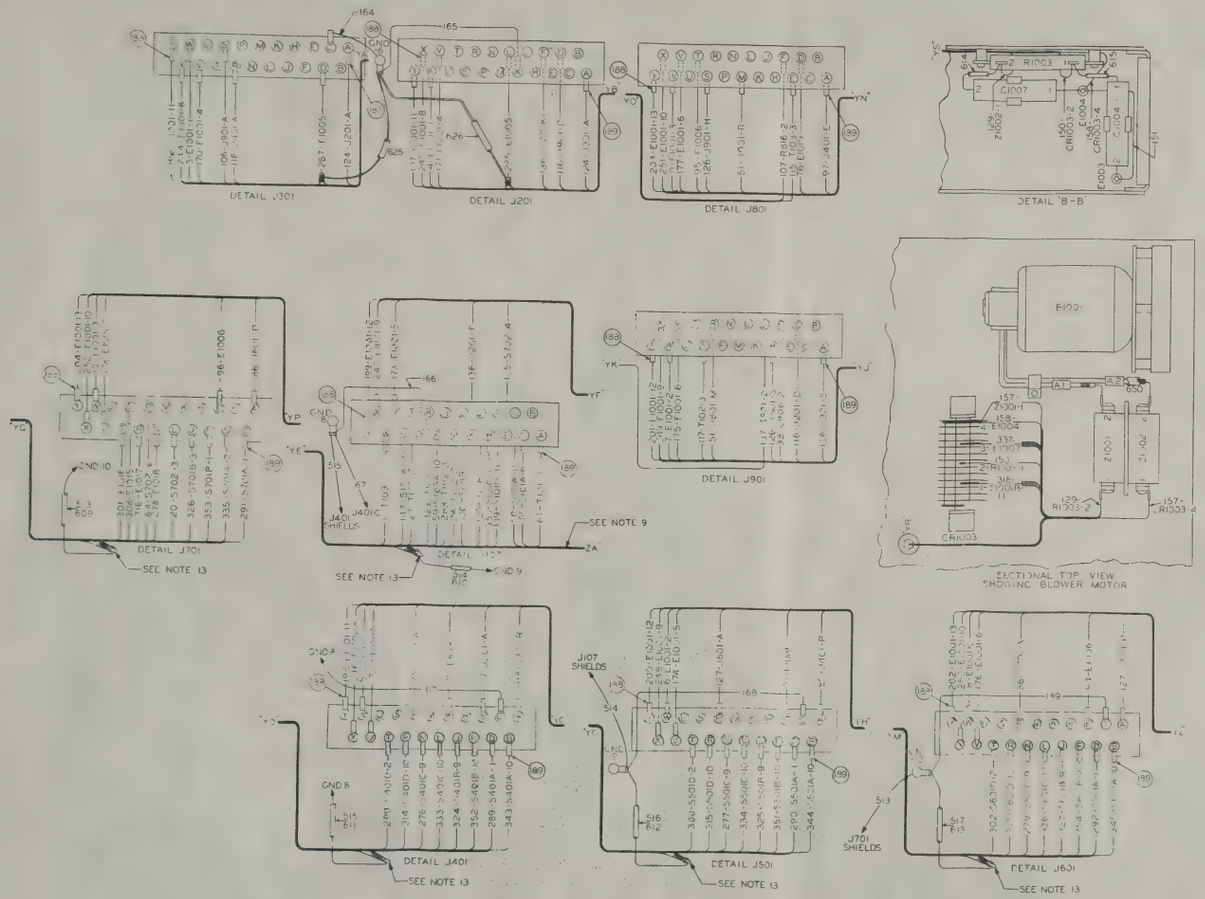
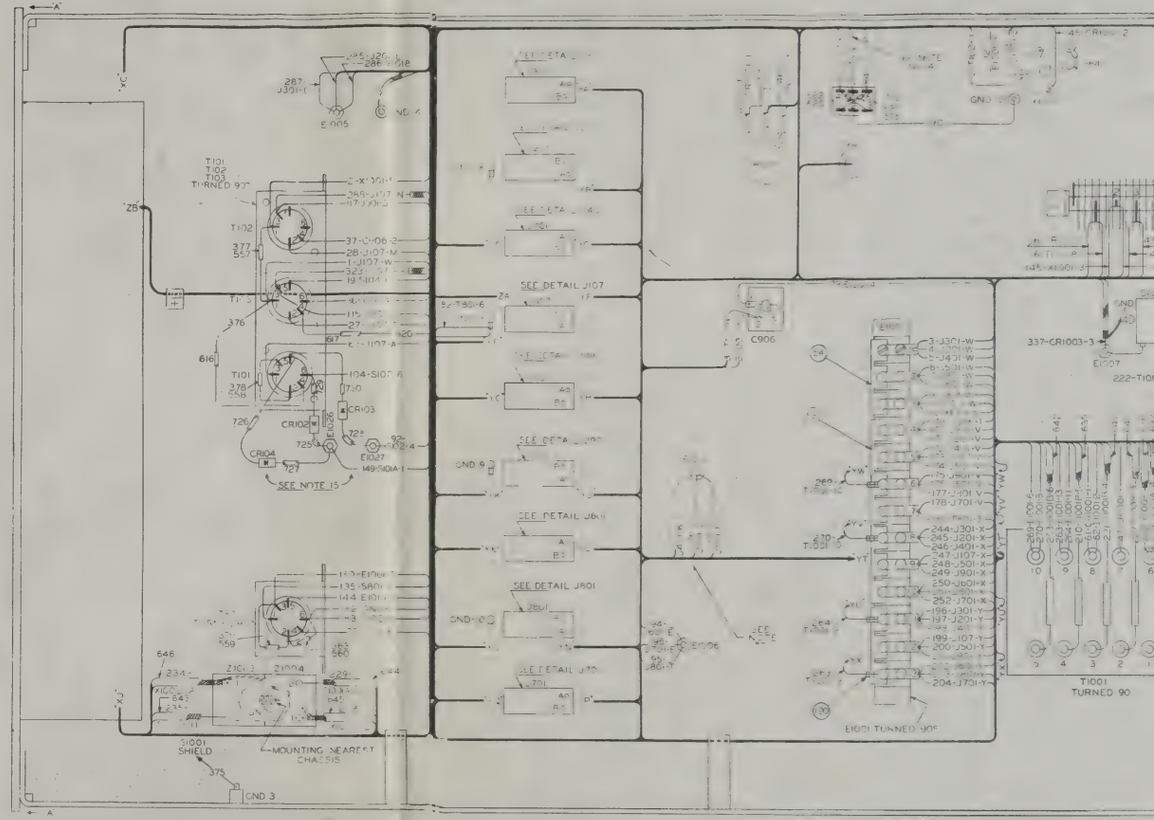
NAVSHIPS 9





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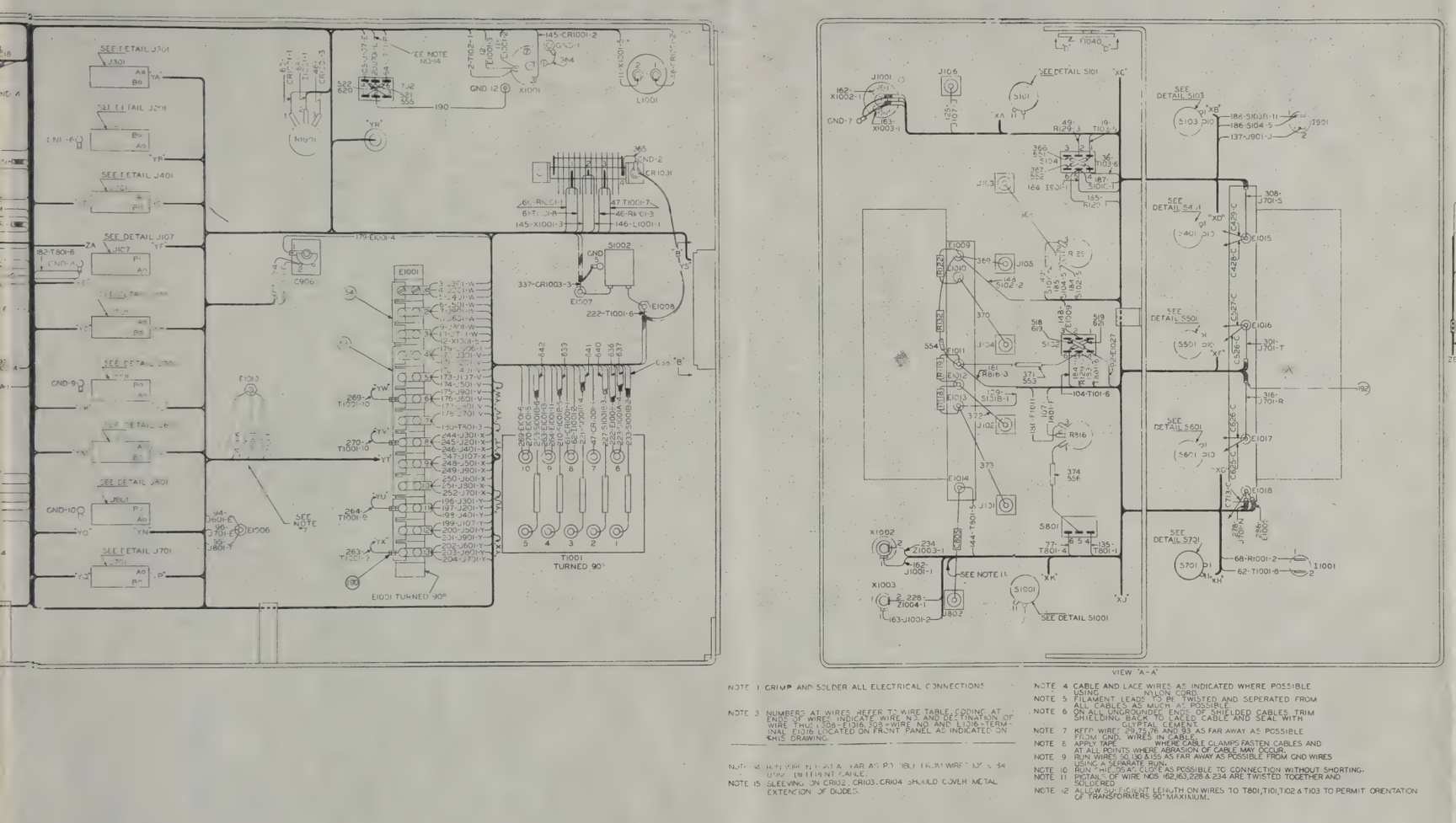
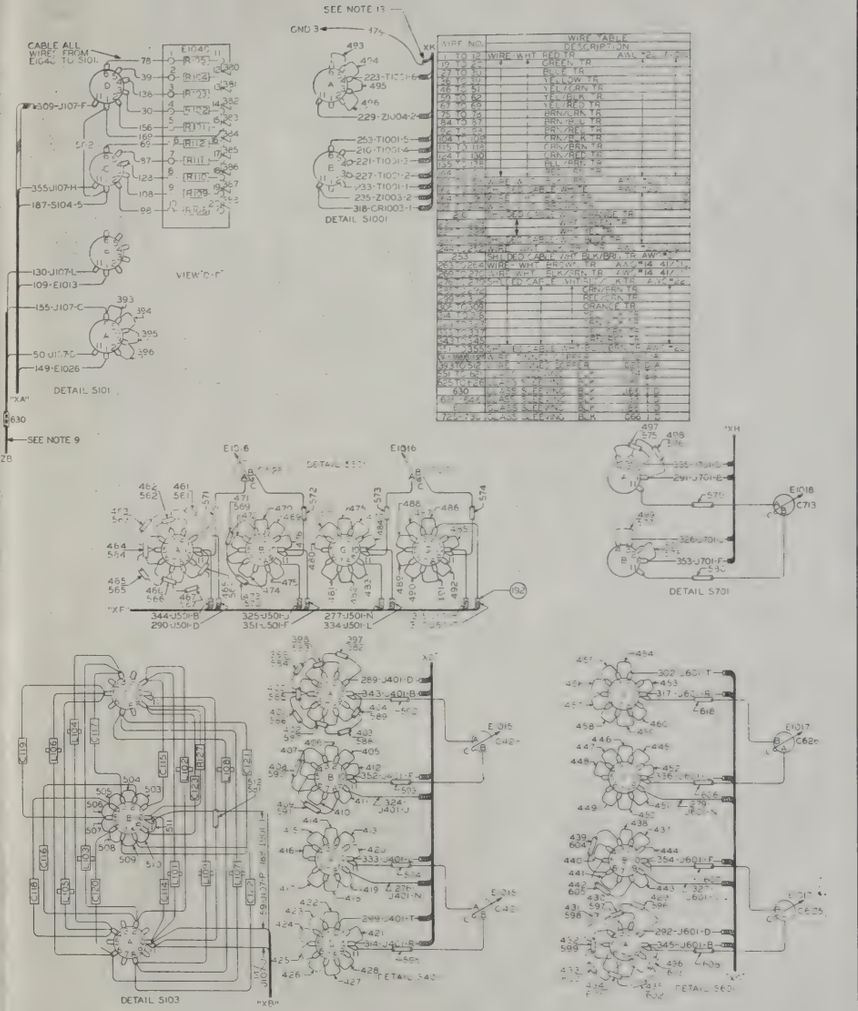




NOTE 1 CRIMP AND SOLDER ALL ELECTRICAL CONNECTIONS.

NOTE 3 NUMBERS AT WIRES REFER TO WIRE TABLE CODING AT ENDS OF WIRES INDICATE WIRE NO. AND DESTINATION OF WIRE THUS: 508-E1016, 508 = WIRE NO. AND E1016 = TERMINAL E1016 LOCATED ON FRONT PANEL AS INDICATED ON THIS DRAWING.

NOTE 4 CABLE AND LACE WIRES AS INDICATED WHERE POSSIBLE USING NYLON CORD.

NOTE 5 FILAMENT LEADS TO BE TWISTED AND SEPERATED FROM ALL CABLES AS MUCH AS POSSIBLE.

NOTE 6 ON ALL UNGROUNDED ENDS OF SHIELDED CABLES TRIM SHIELDING BACK TO LACED CABLE AND SEAL WITH GLYPTAL CEMENT.

NOTE 7 KEEP WIRES 29,25,26 AND 93 AS FAR AWAY AS POSSIBLE FROM GND. WIRES IN CABLE.

NOTE 8 APPLY TAPE WHERE CABLE CLAMPS FASTEN CABLES AND AT ALL POINTS WHERE ABRASION OF CABLE MAY OCCUR.

NOTE 9 RUN WIRES 50,130 & 155 AS FAR AWAY AS POSSIBLE FROM GND WIRES USING A SEPARATE RUN.

NOTE 10 RUN THICK 59 AWG AS CLOSE AS POSSIBLE TO CONNECTION WITHOUT SHORTING.

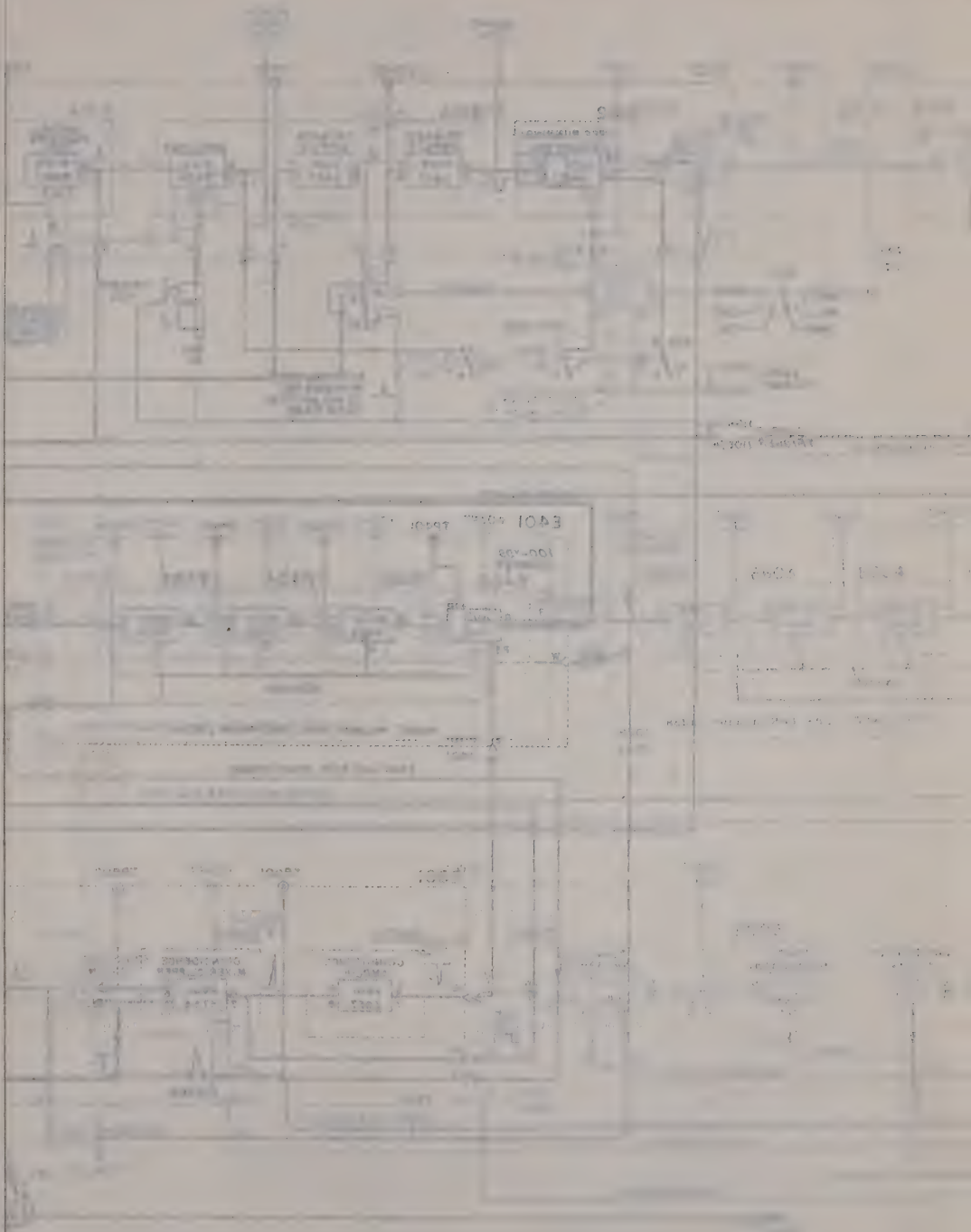
NOTE 11 PIGTAIL'S OF WIRE NOS 162,163,228 & 234 ARE TWISTED TOGETHER AND SOLDERED

NOTE 12 ALLOW SUFFICIENT LENGTH ON WIRES TO T801, T101, T102 & T103 TO PERMIT ORIENTATION OF TRANSFORMERS 90° MAXIMUM.

NOTE 15 SLEEVING ON CR102, CR103, CR104 SHOULD COVER METAL EXTENSION OF DIODES.

Figure 5-36. Wiring Diagram, Main Chassis

394291 O - 56



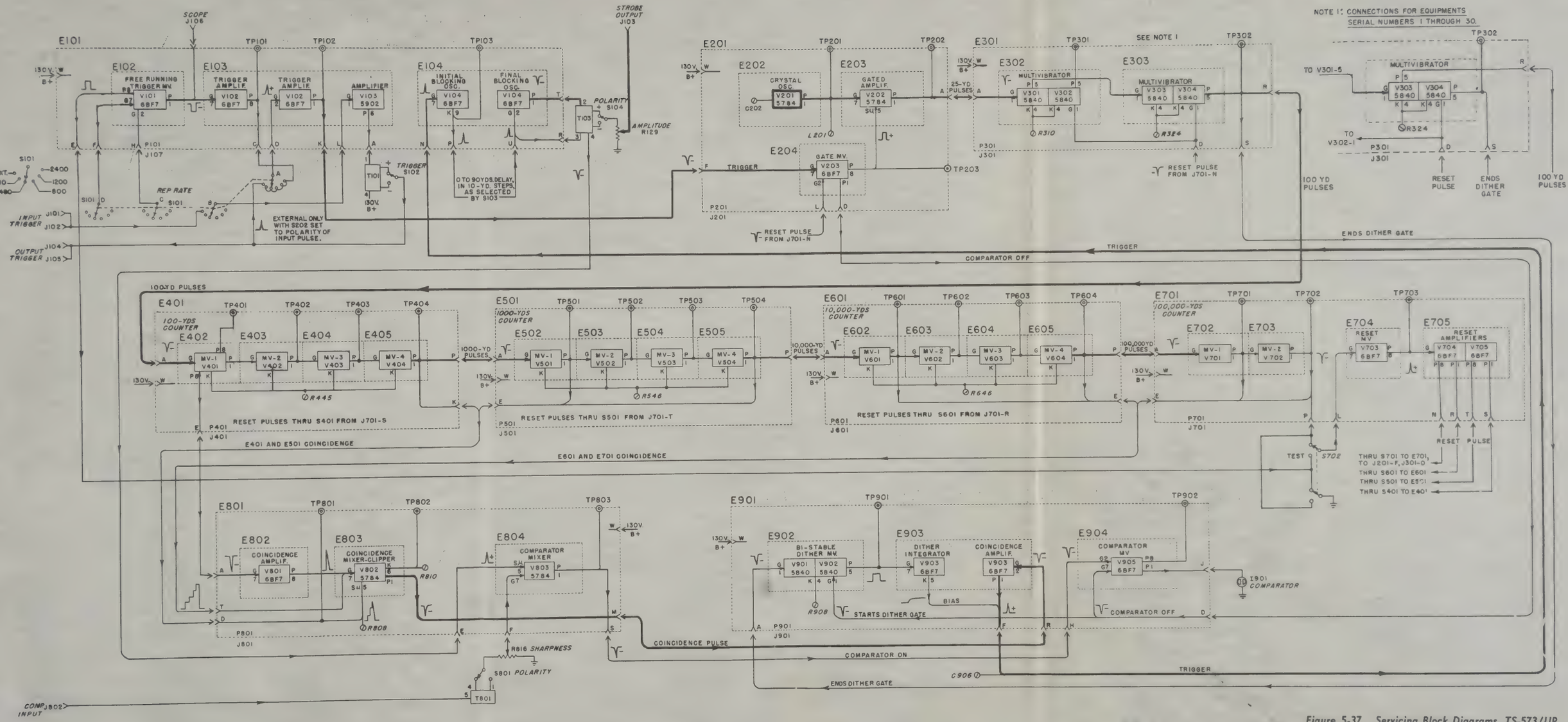
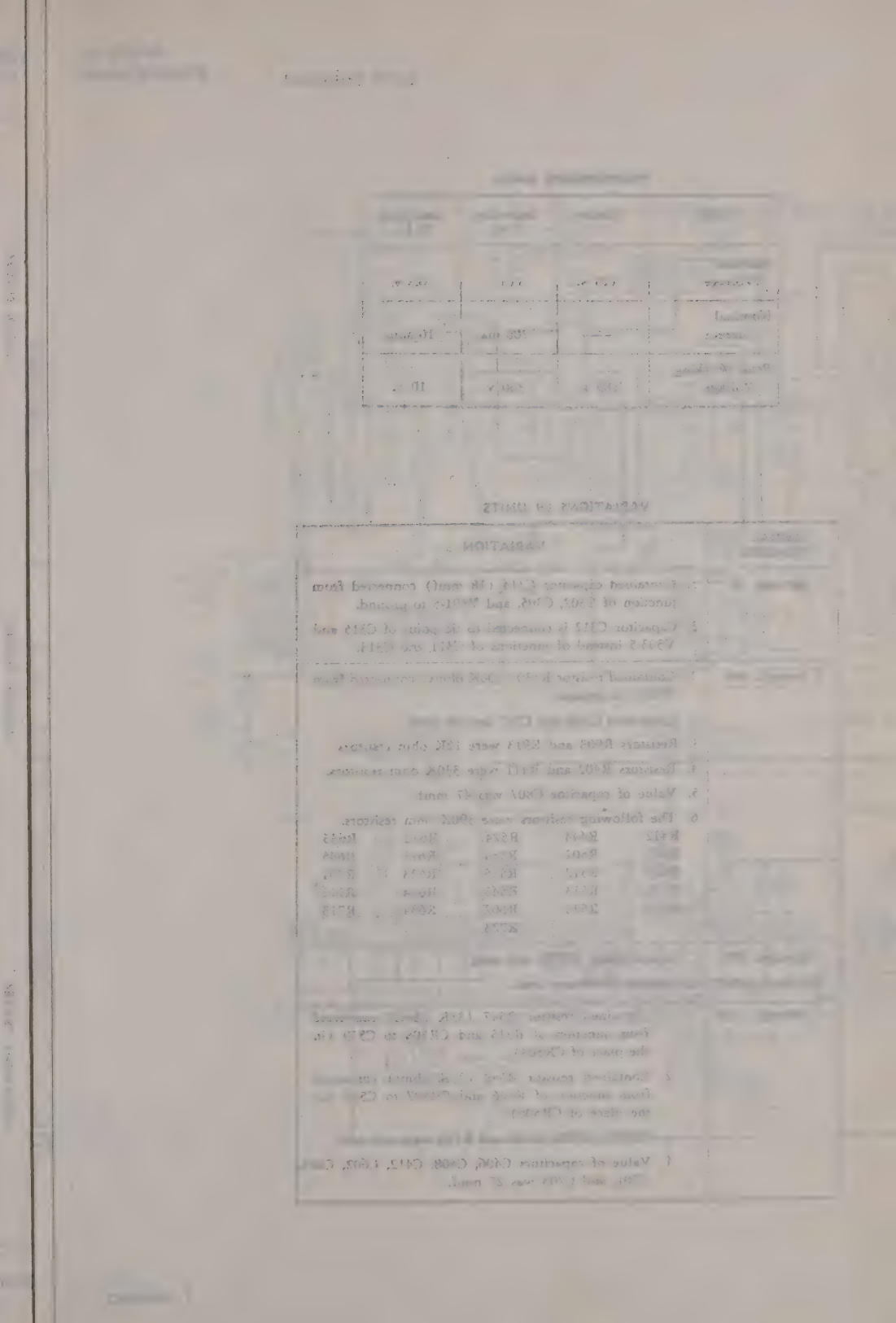


Figure 5-37. Servicing Block Diagrams, TS-573/UP



TRANSFORMER DATA

T1001	Primary	Secondary 7-8	Secondary 9-10
Nominal Voltage	115 v.	113 v.	6.3 v.
Nominal Current	——	200 ma.	10 amp.
Peak Working Voltage	180 v.	300 v.	10 v.

VARIATIONS IN UNITS

SERIAL NUMBERS	VARIATION
1 through 30	1. Contained capacitor C314 (18 mmf) connected from junction of C302, C305, and V301-5 to ground. 2. Capacitor C312 is connected to tie point of C315 and V303-5 instead of junctions of C311 and C313.
1 through 400	1. Contained resistor R330 (100K ohms) connected from V303-1 to ground. 2. Capacitors C316 and C317 are not used. 3. Resistors R903 and R913 were 12K ohm resistors. 4. Resistors R402 and R411 were 330K ohm resistors. 5. Value of capacitor C807 was 47 mmf. 6. The following resistors were 390K ohm resistors. R412 R444 R524 R612 R635 R422 R502 R534 R613 R645 R423 R512 R535 R623 R701 R433 R513 R545 R624 R712 R434 R523 R602 R634 R713 R723
1 through 495 800 through 822	1. Crystal diode CR702 not used. 2. Resistor R738 not used.
1 through 1197	1. Contained resistor R547 (33K ohms) connected from junction of R515 and CR504 to C519 (in the place of CR503). 2. Contained resistor R548 (33K ohms) connected from junction of R526 and CR507 to C520 (in the place of CR506). 3. CR503, CR506, R549 and R550 were not used. 4. Value of capacitors C406, C408, C412, C602, C605, C701, and C703 was 27 mmf.

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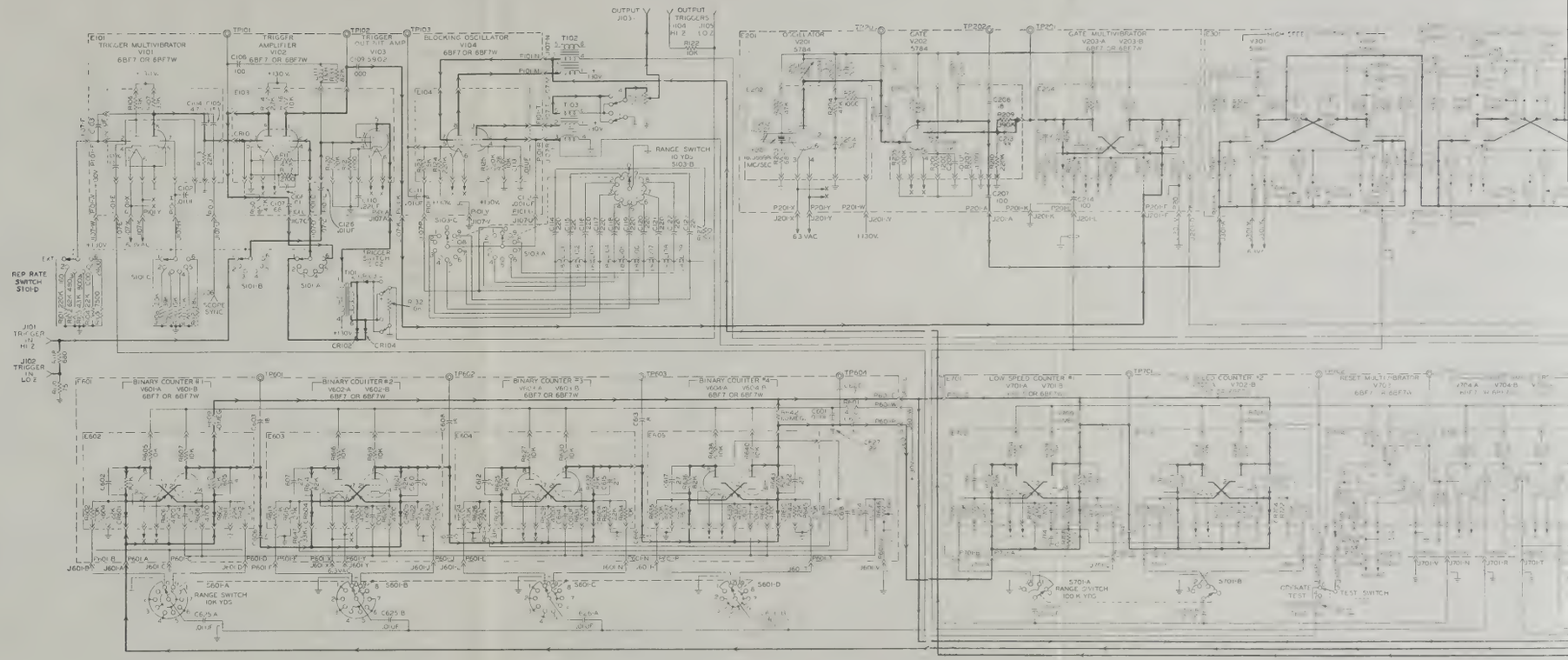

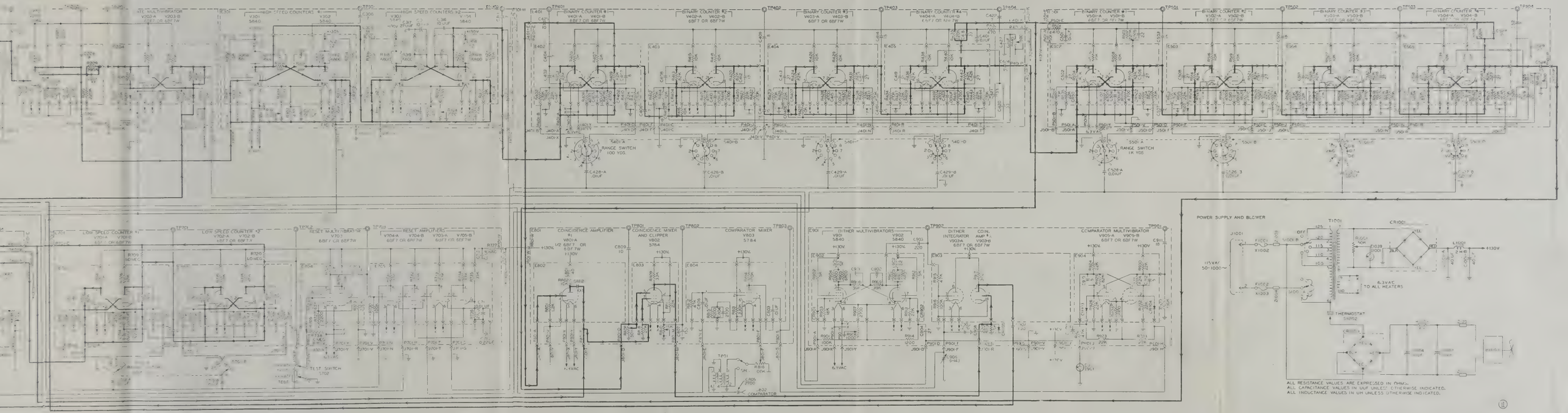

Figure 5-38. Schematic Diagram, TS-573/UP

394291 O - 56

TABLE 6-1. WEIGHTS AND DIMENSIONS OF SPARE PARTS BOXES

EQUIPMENT SPARES						TENDER SPARES						STOCK SPARES					
SPARE PARTS BOX	OVERALL DIMENSIONS (INCHES)			VOLUME (Cu. Ft.)	WEIGHT (Lbs.)	SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME	WEIGHT	SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME	WEIGHT
	HEIGHT	WIDTH	DEPTH				HEIGHT	WIDTH	DEPTH				HEIGHT	WIDTH	DEPTH		
MI-18285-1	6	12	6	0.25	20	—	—	—	—	—	—		Depending upon destination.				

TABLE 6-2. SHIPPING WEIGHTS AND DIMENSIONS OF SPARE PARTS BOXES

EQUIPMENT SPARES							TENDER SPARES							STOCK SPARES						
SHIPPING BOX NUMBER	SPARE PARTS BOX	OVERALL DIMENSIONS (INCHES)			VOLUME (Cu. Ft.)	WEIGHT (Lbs.)	SHIPPING BOX NUMBER	SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME	WEIGHT	SHIPPING BOX NUMBER	SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME	WEIGHT
		Height	Width	Depth					Height	Width	Depth					Height	Width	Depth		
Box 1 of 1	MI-18285-1	8	16½	10¼	0.8	30	—	—	—	—	—	—	—			Depending upon destination.				

TABLE 6-3. LIST OF MAJOR UNITS

SYMBOL GROUP	QUANTITY	NAME OF MAJOR UNIT	NAVY TYPE DESIGNATION
101-1099	1	Range Calibrator	TS-573/UP

TABLE 6-4. TABLE OF REPLACEABLE PARTS
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
101 to 1099			
	F16-Q-304724-200	CALIBRATOR, RANGE: used for calibrating and checking the range measuring circuits of a radar transmitter-receiver; one external trigger pulse, 2.8 microseconds duration, 10 to 50 v positive or negative polarity; 10 to 50 v positive polarity, 0.4 microsecond duration; pulse recurrence frequency: can accept a trigger repetitive rate from 47 to 5000 pulses per sec from an external circuit, the internal pulse recurrence frequency is: 160, 450, 800, 1200, and 2400 pulses per sec; 75 ohms output impedance; ±0.01% + 10 yd of "set-up" range; AC 115 v +10%, 50 to 1000 cycles per sec, single phase, 200 W AC; aluminum cabinet; zinc chromate alkyd type primer gray enamel finish coat; 22½ in. lg by 13 in. wide by 12 in. high overall; mounted in cabinet secured by one screw ea corner of front panel, bottom surface has one rubber bumper ea corner; portable type; c/o three video cables Type RG-62/U, 6 ft 2 in. lg overall, connects to radar set; one power cable RCA part/dwg K-8881726-1, 6 ft lg connects to power supply; 6 connectors u/w video cable one each end type UG-260/U, 1 connector u/w power cable RCA part/dwg K-897777-2; 1 plug u/w power cable RCA part/dwg A-8824395-1; weighs 43½ lb uncrated; has molded rubber, metal handle, folds into grooved area top case, twenty louvers on back of cabinet located in two rows ten ea; a louver is 2⅜ in. lg by 5/16 in. wide extends out 5/32 in.; guide pin back cabinet supports chassis and holds it in place; two latches ea side of cabinet which engage hooks on cover and secure same. Chassis mounted in cabinet on rack and secured from front in ea corner by (1) captive screw; cabinet reinforced by ribbing 3/32 in. wide on all sides variable lengths; heat dissipation 110 W; equipment to operate in ambient temperature range of −55° centigrade to +65° centigrade; front panel has stenciling which indicates Power ON; Comparator; Range in yards; Comparator polarity and sharpness; trigger; Output amplitude and polarity; Power 105, 110, 115, 120, 125, off Rep Rate ext 160, 480, 800, 1200, and 2400 Input Trigger Hi Z and Lo Z; Output Comp Input, Scope chassis has two bar handles; RCA part/dwg D-631771-1	
A-1001	2Z2490.40 For Reference Only	CHASSIS: holds components of radar range calibrator TS-573/UP; aluminum alloy; rectangular; approx 17¾ in. lg by 9⅝ in. wide by 1½ in. high overall; rack mounted in cabinet supported in rear by two guide pins supported on sides by resting on supports of cabinet walls secured in front by one captive screw ea corner; stencil markings indicate location on the chassis of some of the components; RCA part/dwg E-314186-501	Mounting for Electronic Components
A-1002	3F30390-3.3 *	BRACKET: panel support; L-shaped; aluminum alloy; 13¼ in. lg by 2⅜ in. wide by 0.125 in. thick; mounts by one 0.228 in. dia hole one end and two 0.199 in. dia holes other end; two holes are 1 in. apart on one end and the single hole is ½ in. from end, both centers next dimension is 5/16 in.; right hand; RCA part/dwg B-462777-1	Strut from A-1001 to A-1018
A-1003	3F30390-3.4 *	BRACKET: panel support; L-shaped; aluminum alloy; 13¼ in. lg by 2⅜ in. wide by 0.125 in. thick; mounts by one 0.228 in. dia hole one end and two 0.199 in. dia holes other end; two holes are 1 in. apart on one end and the single hole is ½ in. from end, both centers next dimension is 5/16 in.; left hand; RCA part/dwg B-462777-2	Strut from A-1001 to A-1008
A-1004	6Z3660-21 *	VENT, AIR: sheet aluminum alloy; sq end w/ flanged edges; sq object 1⅛ in. deep by 5⅞ in. lg by 5⅞ in. wide overall dim; hole in bottom of duct 4 5/16 in. dia; to conduct air in blower system; eight mounting holes, two on ea flange; RCA part/dwg C-746552-1	Guides Cooling Air from B-1001 thru Exhaust Port of A-1019
A-1005	2Z9057-86 *	SUPPORT, MOUNTING BASE: supports the chassis at the rear when chassis is not inside cabinet; aluminum alloy; generally rectangular; 5 5/16 in. lg by 4 in. wide by 1⅛ in. thick; mounts to chassis by two 0.199 in. dia holes located on end of support at right angle to face on a 2¾ in. by ⅜ in. mounting center; RCA part/dwg C-746655-1	Mounting for Electronic Components and Tail Leg for A-1001
A-1006	2Z3351-524 *	COVER: covers calibrated dial on front panel allowing view of readings thru hole on cover; brass sheet, gray enamel finish; rectangular; 10 in. lg by 1 27/32 in. wide by 9/16 in. high overall; eight mounting holes 0.147 in. dia, one in ea of four corners 5/32 in. by 5/32 in. mounting center; two holes along one side located on 6/32 in. by 3 13/16 in. mounting center from respective end, two holes other side are directly opposite these; has five round holes 5/16 in. dia, four equal spaces between them which measures 2 in. ea, has five elongated holes or slots 3/16 in. by 9/16 in. by 3/32 in. radius w/ true centers 2 in. apart with four equal spaces; RCA part/dwg C-746660-501	Mask for N-1001 thru N-1003

A-1007	3F30390-3.11	MOUNTING, BRACKET: mounts pulse transformer; aluminum alloy; U-shape; 2 3/16 in. lg by 1 1/4 in. wide by 1 in. high; mounts by two 0.219 in. dia holes ea end on right angle bend; has one 13/16 in. dia hole and two 0.147 in. dia holes for mounting; RCA part/dwg A-8823421-1	Mounting for T-801
A-1008	3F30390-3	MOUNTING, BRACKET: mounts three pulse transformers; aluminum alloy; U-shape; 4 5/16 in. lg by 1 1/4 in. wide by 1 in. high; mounts by two 0.173 in. dia holes ea end on right angle bend; has three 13/16 in. dia holes equally spaced and six 0.147 in. dia holes for mounting; RCA part/dwg A-8823422-1	Mounting for T-101, T-102 and T-103
A-1009	3F30390-3.1 *	BRACKET: non-transposition; holds standoff terminals; U-shaped; aluminum alloy; 6 1/4 in. lg by 9/16 in. wide by 15/32 in. high; mounted to panel by four 0.147 in. dia holes, 11 5/16 in. by 3/16 in. mounting center; has four mounting holes 0.147 in. dia on one side and four holes 0.120 in. dia on other side, unevenly spaced and between Symbols E-1015 thru E-1018; RCA part/dwg A-8824340-1	Mounting for E-1015 thru E-1018
A-1010	3F30390-3.2	BRACKET: non-transposition; holds standoff terminals; U-shaped; aluminum alloy; 4 5/8 in. lg by 9/16 in. wide by 15/32 in. high; mounted by three 0.147 in. dia holes, two outside holes are 31 5/16 in. by 3/16 in. mounting center, and center hole is 11 5/16 in. by 3/16 in. mounting center from other two holes; has three mounting holes 0.147 in. dia on one side and six holes 0.120 in. dia on other side, unevenly spaced and between Symbols E-1001 thru E-1014; RCA part/dwg A-8824341-1	Mounting for E-1009 thru E-1014
A-1011	3F33390-3.1 *	PLATE, MOUNTING: spacer for screen; aluminum alloy, satin etch finish; rectangular shape; 5 5/8 in. lg by 7/16 in. wide by 0.040 in. thick overall; two 0.173 in. dia mounting holes spaced 21 5/16 in. C to C; RCA part/dwg A-8824884-1	Spacer between O-1002 and A-1019
A-1012	3F33390-3	PLATE, MOUNTING: spacer for screen; aluminum alloy, satin etch finish; rectangular shape; 5 in. lg by 7/16 in. wide by 0.040 in. thick; two 0.173 in. dia mounting holes spaced 21 5/16 in. C to C; RCA part/dwg A-8824884-2	Spacer between O-1002 and A-1019
A-1013	2Z6820.721	MOUNTING: aluminum alloy (AL-52) Navy spec 47A11 Class A 1/4 hard; satin finish chemical etching process; two filters mounted back to back one ea side of largest surface of this bracket, one screw connects the tabs of filters at 0.199 in. dia hole located close to end of bracket which is fastened to chassis; mounting hole located on 3/32 in. by 3/4 in. mounting center, four mounting holes 0.187 in. dia w/ attached no. 4-40 Quintlock nuts on end; two on ea side 0.437 in. by 7/32 in. mounting center; the pairs of mounting holes are 0.687 in. C to C; marked Z-1003 and Z-1004; for mounting two r-f line filters; RCA part/dwg B-466206-501	Mounting for Z-1003 and Z-1004
A-1014	3F30390-3.9	BRACKET: mounts Z-1001 and Z-1002; L-shape; aluminum alloy, satin etch finish; 2 5/8 in. lg by 1 3/4 in. wide by 3/4 in. high overall; mounts by two 0.199 in. dia holes 1/4 in. from ea end; RCA part/dwg A-8825245-1	Mounting for Z-1001 and Z-1002
A-1015	3F30390-3.10	BRACKET: mounts E-1001 terminal board; L-shape; brass, white nickel finish; 1 1/2 in. lg by 7/16 in. wide by 5/8 in. high by 0.0907 in. thick overall; mounts by two 0.173 in. dia holes 1/4 in. from ea end; RCA part/dwg A-8826905-1	Mounting for E-1001
A-1016	*	POST, SUPPORTING: mounts E-1040 terminal board; aluminum alloy; satin etch finish; cylindrical; 1 in. lg by 1/4 in. sq overall; single tapped mtg hole #6-32 on one end; #6-32 tapped hole 3/4 in. from end thru sq section; RCA part/dwg A-8827056-1	Mounting for E-1040
A-1017	6L3944-2051	PIN, ALIGNMENT: aligns and supports rear of chassis in cabinet; stainless steel; hex nut w/ pin end and thread end; 1 9/32 in. lg by 1/2 in. wide; mounts to cabinet w/ cap nut screwed to thread end 1/4 in.-20; has machined 1/2 in. hex nut 3/8 in. from thread end which is 1/4 in.-20; RCA part/dwg A-8847296-1	Aligns Rear Apron of Chassis in Cabinet
A-1018	3F33175-2	PANEL: front panel showing location of circuit connectors; frosted aluminum clear lacquer finish; rectangular; approx 11 3/4 in. lg by 11 1/8 in. wide by 0.125 in. thick; two 0.2402 in. dia mounting holes, 0.397 in. ±0.006 in. dia by 82 deg countersunk on 10.375 in. by 8.593 in. mounting center; two 0.228 in. dia mounting holes on 10 3/4 in. by 5.156 in. mounting center; two 0.2402 in. dia mounting holes by 0.397 in. dia by 82 deg countersunk on 9.646 in. by 4.781 in. mounting center; two 0.2402 in. dia mounting holes by 0.397 in. dia by 82 deg countersunk on 10.750 in. by 4.406 in mounting center; marked: Power On; Comparator; Range in Yards; Comparator-Polarity, Sharpness-Increase; Trigger; Output-Amplitude-Increase, Polarity; Power-Off, 125, 120, 115, 110, 105, Rep Rate-Ext. 160, 480, 800, 1200, 2400; Input Trigger-Hi Z, Lo Z; Output Trigger-Hi Z, Lo Z; output; Comp Input; Scope; 3A; 3A; RCA part/dwg A-8847758-501 (detail dwg B-49164-1)	Equipment Control Panel
A-1019	6F209-11	CABINET: housing for Radar Range Calibrator; aluminum alloy, outside surfaces gray enamel; empty; 19 7/32 in. lg by 12 13/32 in. wide by 11 51/64 in. high approx overall; one compartment hollow cabinet; one metal handle flush folding type molded rubber, folds below surface of cabinet into grooved area top center; has 20 louvers on back of cabinet top right corner 5 7/16 in. by 5 7/16 in. in area, pressed grooved ribbing 7/32 in. wide and variable lengths; RCA part/dwg A-8847907-501 (outline dwg EE-312491-1, 2, 5, 6, 7)	Housing for the Equipment

CONTRACT NObsr-52327

* Low Failure item—if required requisition from ESO referencing NavShips 900, 180A.

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
A-1020	3F30390-3.6 *	BRACKET: holds a connector into which a plug-in board plugs; U-shaped; aluminum alloy; 3¼ in. lg by ⅞ in. wide by ⅞ in. high; mounts by one hole ea end 0.147 in. dia w/ 2⅞ in. by 5/16 in. mounting center; RCA part/dwg A-8823076-1	Mounting for J-301 thru J-701
A-1021	3F30390-3.12 *	BRACKET: holds a connector into which a plug-in board plugs; U-shaped; aluminum alloy; 3¼ in. lg by ⅞ in. wide by 17/32 in. high; mounts by one hole ea end 0.257 in. dia w/ 2⅞ in. by 5/16 in. mounting center; RCA part/dwg A-8823076-3	Mounting for J-201, J-801 and J-901
B-1001	3H1931-24 Assemble from component parts	BLOWER: propeller blade; electric motor operated; five metal blades, 4 5/16 in. dia; nonportable; guarded, 1/200 hp, 3800 rpm, 74 to 94 v DC; 3 9/16 in. lg, 5.359 in. high, 5¼ in. wide; 50 cfm at 3800 rpm; single speed, sw not incl; direct drive; aluminum anodized; bracket mtd, 4 mtg holes 0.199 in. dia on 5 1/16 in. by 9/16 in. mounting center; ball bearing; Universal Electric Co. Type no. 7-020; RCA part/dwg C-748185-1	Exhaust blower
B-1001A	3H3100A02-26 N17-M-59416-7189	MOTOR, DIRECT CURRENT: shunt wound; operating power requirements 74 to 94 v, DC; 0.13 amp; single take-off shaft, 3800 rpm, cw rotation looking at load end; dust proof; +20 deg C to +85 deg C ambient operating temp; for continuous duty; temp rise 41 deg C; flatted shaft; motor, 2 9/16 in. lg excluding shaft by 1⅝ in. dia by ¼ in. dia shaft, shaft extends 25/32 in. beyond case, shaft is centrally located; two terminal, wire pigtail type; clamp mounting; mounts by circular clamp not supplied with motor; resistant to salt water spray, fungus resistant, stainless steel shaft; Universal Electric Co. Catalog no. 7-020-1; RCA part/dwg C-748185-2	Spare Motor for Blower B-1001
B-1001B	3H450-20 N17-B-86638-8688	BRUSH, ELECTRICAL CONTACT: rectangular shape; 13/64 in. lg by 0.185 in. sq overall, w/ shunt and pressure spring, ½ in. lg; beveled brush contact, 3 to 4 deg bevel; concave contact surface; mounts by insertion; brush, copper oxide lead tamping compound; AN, AF; Grade U. S. G. 235; polarity marked on ea brush; Universal Electric Corp., Part no. 25A9A-7; commutator brush; RCA part/dwg A-8810531-1	Spare Brushes for Blower B-1001
B-1001C	3H388-101 *	FAN: propeller blade; electric motor operated; 5 aluminum blades, 4 5/16 in. dia; nonportable; unguarded; 4 5/16 in. dia by ¾ in. lg overall approx; 50 cfm at 3800 rpm; direct drive; shaft mounting, ¼ in. dia; anodized; Universal Electric Corp., Part no. 59A20; RCA part/dwg A-8810532-1	Spare Fan for Blower B-1001
B-1001D	2Z1607-132 *	CAP, ELECTRICAL CONTACT BRUSH: brass, tin plated; 0.114 in. lg by 5/16 in. dia, overall; mounts by insertion w/ 5/16 in. -32 thread; one end has screwdriver slot, other end is undercut to 0.265 in. dia by 0.02 in. lg half-dog point; used as contact brush retainer; Universal Electric Co., Part no. 14A5; RCA part/dwg A-8810528-1	Spare Brush Cap for Blower B-1001
B-1001E	3H305-283 G77-B-111-00702-1000	BEARING, BALL: single row radial; single shield; light duty; 0.2756 in. bore, 0.8661 in. OD, 0.2756 in. width; 7 balls; lubricated per MIL-G-3278; std fit; ABEC-1 std tolerance; New Departure Catalog no. 7037; RCA part/dwg A-8810530-1	Spare Bearing for Blower B-1001
B-1001F	3H305-282 G77-B-111-00403-1000	BEARING, BALL: single row radial; single shield; light duty; 0.1575 in. bore, 0.6299 in. OD, 0.1969 in. width; 6 balls; lubricated per MIL-G-3278; std fit; ABEC-1 std tolerance; New Departure Catalog no. 7034X1; RCA part/dwg A-8810529-1	Spare Bearing for B-1001
C-101	3D9018-38 N16-C-16061-6823	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 18 mmf ±10%; 500 v DC working; temp coefficient, 330 mmf per mf per deg C neg, tolerance ±49.5 mmf per mf per deg C, or ±15%; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminal, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-12	Coupling Capacitor for V-103 when REP. RATE SW is on EXTERNAL
C-102	3K3510353 N16-C-33612-3276	CAPACITOR, FIXED, MICA DIELECTRIC: JAN type CM35E103G; 10,000 mmf ±2%; 300 v DC working; temp coefficient −20 to +100 mmf per mf per deg C; molded thermosetting case; case, 53/64 in. max lg by 53/64 in. max wide by 1 1/32 in. max deep; two axial wire lead type terminals; terminal mounted; color coded; spec JAN-C-5; RCA part/dwg P-722033-563	Coupling Capacitor for V-101B
C-103		Same as C-102	Coupling Capacitor for V-101A
C-104	3D9047-74 N16-C-16543-7905	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 47 mmf ±10%; 500 v DC working; temp coefficient, 1500 mmf per mf per deg C neg, ±225 mmf per mf per deg C or ±15%; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminal; tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-5	Coupling Capacitor for V-102A
C-105		Same as C-101	Coupling Capacitor for Scope Sync.

C-106	3D9100-338 N16-C-17086-7995	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 100 mmf ±10%; 500 v DC working; temp coefficient 2200 mmf per mf per deg C neg, tolerance ±330 mmf per mf per deg C or ±15%; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-7	Coupling Capacitor for V-103 when REP. RATE SW is on INTERNAL
C-107	3D9068-41 N16-C-16798-9875	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 68 mmf ±10%; 500 v DC working; temp coefficient, 2200 mmf per mf per deg C neg, tolerance ±330 mmf per mf per deg C or ±15%; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-15	Coupling Capacitor for V-102B when REP. RATE SW is on INTERNAL
C-108	3DA10-627 N16-C-19140-9675	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 10,000 mmf +100% −0%; 450 v DC working; temp coefficient variable; insulated, phenolic body; case, $^{19}/_{32}$ in. dia by $^{6}/_{32}$ in. thick; two terminals, tangential rigid wire lead type; terminal mounted; RCA part/dwg B-449696-55	Cathode Bypass for V-102B
C-109	3DA1-371 N16-C-18661-1280	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1000 mmf +100% −0%; 500 v DC working; temp coefficient variable; insulated, phenolic body; case, $^{6}/_{16}$ in. dia by $^{5}/_{32}$ in. thick; two terminals, tangential rigid wire lead type; terminal mounted; RCA part/dwg B-449696-57	Coupling Capacitor for V-203A
C-110	3DA220-25 N16-C-46200-9901	CAPACITOR, FIXED, PAPER DIELECTRIC: one section; 220,000 mmf ±20%; 100 v DC working; hermetically sealed metal case; case, excluding terminals w/ plastic insulating sleeve $^{15}/_{16}$ in. lg by 0.462 in. dia; two terminals, axial wire lead type; stabilized wax impregnated; no internal ground connections; mounted by terminals; Sprague Electric Co., Part no. 88P22401B4; RCA part/dwg C-737818-35	Cathode Bypass for V-103
C-111		Same as C-102	Cathode Bypass for V-104A
C-112	3K2510253 N16-C-31080-2527	CAPACITOR, FIXED, MICA DIELECTRIC: JAN type No. CM25E102G; 1000 mmf ±2%; 500 v DC working; temp coefficient −20 to +100 mmf per mf per deg C; molded thermosetting case $1^{1}/_{16}$ in. lg ±$^{3}/_{64}$ in. by $^{15}/_{32}$ in. max wide by $^{7}/_{32}$ in. max deep, mounted by two solid wire lead terminals $1^{1}/_{8}$ in. min lg located one on ea end; RCA part/dwg P-722015-597	Coupling Capacitor for V-104B
C-113		Same as C-108	Cathode Bypass for V-104B
C-114	3D9220-43 N16-C-17726-8115	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 220 mmf ±10%; 500 v DC working; temp coefficient, 4700 mmf per mf per deg C neg, tolerance ±705 mmf per mf per deg C or ±15%; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-17	Charging Capacitor for Delay Line
C-115		Same as C-114	Charging Capacitor for Delay Line
C-116		Same as C-114	Charging Capacitor for Delay Line
C-117		Same as C-114	Charging Capacitor for Delay Line
C-118		Same as C-114	Charging Capacitor for Delay Line
C-119		Same as C-114	Charging Capacitor for Delay Line
C-120		Same as C-114	Charging Capacitor for Delay Line
C-121		Same as C-114	Charging Capacitor for Delay Line
C-122		Same as C-114	Charging Capacitor for Delay Line
C-123		Same as C-114	Charging Capacitor for Delay Line
C-124		Same as C-114	Charging Capacitor for Delay Line
C-125		Not Used	
C-126		Same as C-108	Coupling Capacitor for V-103 to T-101
C-127 thru C-200		Not Used	
C-201	3DA100-1169 N16-C-45803-3215	CAPACITOR, FIXED, PAPER DIELECTRIC: one section; 100,000 mmf ±20%; 200 v DC working; hermetically sealed metal case w/ plastic insulating sleeve; case, 1 in. lg by 0.374 in. dia; two axial wire lead type terminals; stabilized wax impregnated; no internal ground connections; mounted by terminals; Sprague Electric Co. Part no. 88P; RCA part/dwg C-737818-73	Filter Bypass

* Low Failure item---if required requisition from ESO referencing NavShips 900, 180A.

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
C-202	3D9025V-82 N16-C-64036-4565	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: JAN type No. CV11A250; rotary type; one section; temp coefficient 0 mmf per mf per deg C; 4.5 to 25.0 mmf; 500 v DC working; $^{27}/_{32}$ in. lg by $^{41}/_{64}$ in. wide by $^{13}/_{32}$ in. high overall; two terminals, solder lug type; located at ends; two 0.120 in. dia mounting holes spaced $^{7}/_{16}$ in. C to C; screwdriver slot adjustment; ceramic base; spec JAN-C-81; RCA part/dwg P-728680-2	Crystal Tuner
C-203		Same as C-109	+B Filter Bypass for E-201
C-204		Same as C-108	Screen Grid Bypass for V-201
C-205		Same as C-109	Coupling Capacitor for V-202
C-206		Same as C-101	Test Point Coupling Capacitor for TP-202
C-207		Same as C-106	Coupling Capacitor to V-301 and V-302
C-208		Not Used	
C-209		Same as C-108	Cathode Bypass for V-202
C-210	3D9005-144 N16-C-15627-7002	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 5 mmf ±0.5 mmf; 500 v DC working; temp coefficient, 0 mmf per mf per deg C neg/pos, tolerance ±30 mmf per mf per deg C or ±15% whichever is greater; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-1	Grid Bypass for V-203B
C-211		Same as C-210	Grid Bypass for V-203A
C-212		Same as C-101	Test Point Coupling Capacitor for TP-201
C-213	3D9033-53 N16-C-16318-7901	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 33 mmf ±10%; 500 v DC working; temp coefficient, 750 mmf per mf per deg C neg, tolerance ±112.5 mmf per mf per deg C or ±15%; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-14	Grid Bypass for V-202
C-214		Same as C-106	Coupling Capacitor for V-203B
C-215 thru C-300		Not Used	
C-301		Same as C-108	Coupling Capacitor for V-304
C-302	3D9007-47 N16-C-15758-1002	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 7 mmf ±10%; 500 v DC working; temp coefficient, 0 mmf per mf per deg C neg/pos, tolerance ±30 mmf per mf per deg C; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-9	Grid Bypass for V-302
C-303		Same as C-109	Cathode Bypass for V-301 and V-302
C-304		Same as C-302	Grid Bypass for V-301
C-305		Same as C-101	Coupling Capacitor for V-303 and V-304
C-306		Same as C-302	Coupling Capacitor for TP-301
C-307		Same as C-108	Coupling Capacitor for V-302
C-308		Same as C-302	Grid Bypass for V-304
C-309		Same as C-109	Cathode Bypass for V-303 and V-304
C-310		Same as C-302	Grid Bypass for V-303
C-311		Same as C-302	Coupling Capacitor for TP-302
C-312		Same as C-107	Coupling Capacitor for V-401

C-313	3D9010-229 N16-C-15919-9876	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 10 mmf ±1 mmf; 500 v DC working; temp coefficient, 0 mmf per mf per deg C neg/pos, tolerance ±30 mmf per mf per deg C; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-11	Coupling Capacitor for V-901 and V-902
C-314		Same as C-101 on equipments w/ serial no. 1 through 30; not used on equipments w/ serial no. above 30	
C-315		Same as C-313	Grid Bypass for V-304
C-316		Same as C-313	Grid Bypass for V-303
C-317	3D9027-57 N16-C-16254-5302	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 27 mmf ±10%; 500 v DC working; temp coefficient, 750 mmf per mf per deg C neg, tolerance ±112.5 mmf per mf per deg C or ±15%; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-13	Bypass Capacitor for V-303
C-318 thru C-400		Not Used	
C-401		Same as C-201	Filter Bypass
C-402		Not Used	
C-403		Same as C-101	Grid Bypass for V-401B
C-404		Same as C-302	Coupling Capacitor for TP-401
C-405		Same as C-109	Cathode Bypass for V-401
C-406		Same as C-317 on equipments w/serial no. 1 through 1197 Same as C-101 on equipments w/serial no. 1198 and above	Coupling for V-402
C-407		Same as C-101	Grid Bypass for V-401A
C-408		Same as C-317 on equipments w/serial no. 1 through 1197 Same as C-101 on equipments w/serial no. 1198 and above	Grid Bypass for V-402B
C-409		Same as C-101	Coupling Capacitor for TP-402
C-410		Same as C-109	Cathode Bypass for V-402
C-411	3D9015-170 N16-C-15997-5451	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 15 mmf ±10%; 500 v DC working; temp coefficient, 330 mmf per mf per deg C neg, tolerance ±49.5 mmf per mf per deg C; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick, two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-3	Coupling Capacitor for V-403
C-412		Same as C-317 on equipments w/serial no. 1 through 1197 Same as C-101 on equipments w/serial no. 1198 and above	Grid Bypass for V-402A
C-413		Same as C-317	Grid Bypass for V-403B
C-414		Same as C-101	Coupling Capacitor for TP-403
C-415		Same as C-109	Cathode Bypass for V-403
C-416		Same as C-411	Coupling Capacitor for V-404
C-417		Same as C-317	Grid Bypass for V-402A
C-418		Same as C-213	Coincidence Bypass Capacitor
C-419		Same as C-317	Grid Bypass Capacitor for V-404B
C-420		Same as C-213	Feedback Coupling Capacitor for V-402
C-421		Same as C-213	Feedback Coupling Capacitor for V-403
C-422		Same as C-302	Coupling Capacitor for TP-404
C-423		Same as C-109	Cathode Bypass for V404
C-424		Same as C-411	Coupling Capacitor for V-501
C-425		Same as C-313	Coupling Capacitor for V-401B to V-801A
C-426		Same as C-317	Grid Bypass for V-404A
C-427		Same as C-201	Cathode Bypass Capacitor for V-401, V-402, V-403, V-404

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
C-428	3DA10-626 N16-C-19250-4502	CAPACITOR, FIXED, CERAMIC DIELECTRIC: two sections; 10,000 mmf ea section; +100% −0; 500 v DC; temp coefficient, variable; insulated, phenolic body; case, ⅜ in. dia by 7/32 in. thick; three rigid wire lead type terminals; terminal mounted; RCA part/dwg A-990119-53	Reset Coupling Capacitor for V-401 and V-402
C-429		Same as C-428	Reset Coupling Capacitor for V-403 and V-404
C-430 thru C-500		Not Used	
C-501		Same as C-201	Filter Bypass Capacitor
C-502		Same as C-317	Grid Bypass for V-501B
C-503		Same as C-101	Coupling for TP-501
C-504		Same as C-109	Cathode Bypass for V-501
C-505	3D9022-66 N16-C-16158-5395	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 22 mmf ±10%; 500 v DC working; temp coefficient 750 mmf per mf per deg C neg, tolerance ±112.5 mmf per mf per deg C or ±15%; insulated, phenolic body; case, ¼ in. dia by 0.156 in. thick; two terminals, tangential rigid wire type: terminal mounted; RCA part/dwg B-458528-4	Coincidence Bypass Capacitor
C-506		Same as C-317	Grid Bypass for V-501A
C-507		Same as C-411	Coupling Capacitor for V-502
C-508		Same as C-317	Grid Bypass for V-502B
C-509		Same as C-101	Coupling Capacitor for TP-502
C-510		Same as C-109	Cathode Bypass for V-502
C-511		Same as C-317	Grid Bypass for V-502A
C-512		Same as C-411	Coupling Capacitor for V-503
C-513		Same as C-317	Grid Bypass for V-503B
C-514		Same as C-101	Coupling Capacitor for TP-503
C-515		Same as C-109	Cathode Bypass for V-503
C-516		Same as C-317	Grid Bypass for V-503A
C-517		Same as C-411	Coupling Capacitor for V-504
C-518		Same as C-317	Grid Bypass for V-504B
C-519		Same as C-505	Feedback Coupling for V-502
C-520		Same as C-317	Feedback Coupling Capacitor for V-503
C-521		Same as C-302	Coupling Capacitor for TP-504
C-522		Same as C-109	Cathode Bypass for V-504
C-523		Same as C-317	Grid Bypass for V-504A
C-524		Same as C-411	Coupling Capacitor for V-601
C-525		Same as C-201	Cathode Bypass for V-501, V-502, V-503, V-504
C-526		Same as C-428	Reset Coupling Capacitor for V-501 and V-502
C-527		Same as C-428	Reset Coupling Capacifor for V-503 and V-504

C-528		Same as C-313	Coincidence Bypass Capacitor
C-529		Same as C-317	Bypass Capacitor for V-504B
C-530 thru C-600		Not Used	
C-601		Same as C-201	Filter Bypass for E-601
C-602		Same as C-317 on equipments w/serial no. 1 through 1197 Same as C-101 on equipments w/serial no. 1198 and above	Grid Bypass for V-601B
C-603		Same as C-101	Coupling Capacitor for TP-601
C-604		Same as C-109	Cathode Bypass for V-601
C-605		Same as C-317 on equipments w/serial no. 1 through 1197 Same as C-101 on equipments w/serial no. 1198 and above	Grid Bypass for V-601A
C-606		Same as C-411	Coupling Capacitor for V-602
C-607		Same as C-317	Grid Bypass for V-602B
C-608		Same as C-101	Coupling Capacitor for TP-602
C-609		Same as C-109	Cathode Bypass for V-602
C-610		Same as C-317	Grid Bypass for V-602A
C-611		Same as C-411	Coupling Capacitor for V-603
C-612		Same as C-317	Grid Bypass for V-603B
C-613		Same as C-101	Coupling Capacitor for TP-603
C-614		Same as C-109	Cathode Bypass for V-603
C-615		Same as C-317	Grid Bypass for V-603A
C-616		Same as C-411	Coupling Capacitor for V-604
C-617		Same as C-317	Grid Bypass for V-604B
C-618		Same as C-101	Feedback Coupling for V-603
C-619		Same as C-213	Feedback Coupling for V-602
C-620		Same as C-302	Coupling Capacitor for TP-604
C-621		Same as C-109	Cathode Bypass for V-604
C-622		Same as C-317	Grid Bypass for V-604A
C-623		Same as C-411	Coupling Capacitor for V-701
C-624		Same as C-201	Cathode Bypass for V-601, V-602, V-603, V-604
C-625		Same as C-428	Reset Coupling Capacitor for V-601 and V-602
C-626		Same as C-428	Reset Coupling Capacitor for V-603 and V-604
C-627		Same as C-505	Bypass Capacitor for V-604B
C-628 thru C-700		Not Used	
C-701		Same as C-317 on equipments w/serial no. 1 through 1197 Same as C-101 on equipments w/serial no. 1198 and above	Grid Bypass for V-701B
C-702		Same as C-109	Cathode Bypass for V-701
C-703		Same as C-317 on equipments w/serial no. 1 through 1197 Same as C-101 on equipments w/serial no. 1198 and above	Grid Bypass for V-701A
C-704		Same as C-411	Coupling Capacitor for V-702
C-705		Same as C-317	Grid Bypass for V-702B
C-706		Same as C-109	Cathode Bypass for V-702

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
C-707		Same as C-317	Grid Bypass for V-702A
C-708		Same as C-107	Coupling Capacitor for V-703
C-709	3DA1-419 N16-C-18659-7522	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 1000 mmf ±20%; 500 v DC working; temp coefficient variable; insulated, phenolic body; case, 19/32 in. dia by 5/32 in. thick; two tangential wire lead terminals; terminal mounted; color coded or stamped for capacitance and tolerance; RCA part/dwg A-990167-113	Coupling Capacitor for V-703A
C-710		Same as C-106	Coupling Capacitor for V-704 and V-705
C-711		Same as C-108	Cathode Bypass for V-704 and V-705
C-712		Same as C-201	Filter Bypass for E-701
C-713		Same as C-428	Filter Bypass for E-701
C-714		Same as C-201	Cathode Bypass for V-701 and V-702
C-715		Same as C-110	Cathode Bypass for V-704 and V-705
C-716 thru C-801		Not Used	
C-802		Same as C-106	Coupling from V-801 to V-802
C-803		Same as C-108	Coupling Capacitor for V-905
C-804	3DA2.700-12 N16-C-18918-8976	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 2700 mmf +30% −20%; 250 v DC working; temp coefficient, variable; insulated, phenolic body; case, 1/4 in. dia by 0.156 in. thick; two terminals, tangential rigid wire type; terminal mounted; RCA part/dwg B-458528-201	Cathode Bypass for V-803
C-805		Same as C-804	Coupling from J-802 to T-801
C-806		Same as C-108	Coupling Capacitor for V-803
C-807	3D9150-116 N16-C-28975-1524	Same as C-104 in equipments w/ serial no. 1 through 400. In equipments w/ serial no. above 400 description is as follows: CAPACITOR, FIXED, MICA DIELECTRIC: 150 mmf ±5%; 500 v DC working; −100 to +100 mmf per mf per deg C temp coefficient; molded bakelite case; 33/64 in. max lg by 19/64 in. max wide by 7/32 in. max deep; two wire lead terminals located one on ea end; terminal mounted; color coded; Electro-Motive Type CM15D151J; RCA part/dwg C-737817-335	Bypass for B-801
C-808		Not Used	
C-809		Same as C-313	Coupling for TP-501
C-810 thru C-900		Not Used	
C-901		Same as C-302	Grid Bypass for V-902
C-902		Same as C-302	Grid Bypass for V-901
C-903		Same as C-114	Coupling Capacitor for V-903A
C-904		Same as C-317	Coupling Capacitor for V-902
C-905	3D9200-106 N16-C-29265-2821	CAPACITOR, FIXED, MICA DIELECTRIC: JAN type CM15D201J; 200 mmf ±5%; 500 v DC working; temp coefficient ±100 mmf per mf per deg C; molded low loss bakelite case; 1/2 in. lg by 9/32 in. wide by 3/16 in. high; mounted by two solid wire lead terminals 1 1/4 in. lg min by 0.032 in. dia located axially one ea end; color coded; JAN type designation to be assigned when case is included in MIL Spec, JAN C-5; RCA part/dwg C-737817-338	Integrating Capacitor for V-903A

C-906	3D9143V N16-C-61140-8100	CAPACITOR, VARIABLE, AIR DIELECTRIC: JAN type CT1B150; plate meshing type; one section; 143 mmf max, 9 mmf min; straight line capacity tuning characteristic, 600 v rms test; 1 15/16 in. lg max by 15/16 in. wide max by 1 7/32 in. high max, excluding shaft and bushing; bushing 3/32 in. lg by 19/64 in. dia; shaft beyond bushing 7/32 in. lg by 1/4 in. dia; screwdriver adjustment, 180 deg rotation; insulated base; two terminals, one solder lug type, one solder post type; two no. 4-40 tapped mounting holes on 21/32 in. centers; Spec JAN-C-92; RCA part/dwg P-727819-7	Integrating Adjustment Capacitor for V-903A
C-907		Same as C-106	Coupling from V-903B to T-102
C-908		Same as C-114	Coupling Capacitor for V-903B
C-909		Same as C-101	Coupling Capacitor for V-905
C-910		Same as C-210	Grid Bypass for V-905A
C-911		Same as C-101	Coupling from TP-902 to V-905
C-912		Same as C-210	Grid Bypass for V-905B
C-913 thru C-1000		Not Used	
C-1001	3DB40-80 N16-C-22729-8740	CAPACITOR, FIXED, ELECTROLYTIC: JAN type CE53C400J; three sections; 40 mf capacity per section; 150 v DC working; −40 deg C to +85 deg C working temp range; hermetically sealed metal can; case, 2 1/2 in. lg by 1 1/2 in. dia max at base; four terminals, pin type; located on bottom; terminals insulated from can; plug-in type; in std medium octal socket; spec JAN-C-62; RCA part/dwg P-735712-78	Power Filter Capacitor
C-1002 C-1003		Not Used	
C-1004	3DB1-430 N16-C-48810-4001	CAPACITOR, FIXED, PAPER DIELECTRIC: one section; 1 mf ±10%; 100 v DC working; hermetically sealed metal case; case, 1 1/2 in. lg by 0.624 in. dia; two terminals, axial wire lead type; stabilized wax impregnated; no internal ground connection; mounted by terminals; Sprague Electric Co. Part no. 88P; RCA part/dwg C-737818-57	Blower Filter Capacitor
C-1005 C-1006		Not Used	
C-1007		Same as C-1004	Blower Filter Capacitor
CR-101	3Z3565-16 N16-T-55450-0070	CRYSTAL UNIT, RECTIFYING: germanium type; 40 ma max continuous current; 125 ma max peak forward current; 50 v peak inverse voltage; 0.8 mmf shunt capacitance; body dim, excluding terminals; 1/2 in. max lg by 0.225 in. max dia; terminal mounted; two terminals, axial wire lead type, located one ea end; surge current for one sec 350 ma; General Electric Type G5S3	Clipping Diode for V-102
CR-102		Same as CR-101	Trigger Overshoot Limiting Crystal
CR-103		Same as CR-101	Trigger Overshoot Limiting Crystal
CR-104		Same as CR-101	Trigger Overshoot Limiting Crystal
CR-105 thru CR-200		Not Used	
CR-201		Same as CR-101	Diode for V-203B
CR-202		Same as CR-101	Diode for V-203A
CR-203 thru CR-300		Not Used	
CR-301		Same as CR-101	Diode for V-301
CR-302		Same as CR-101	Diode for V-302
CR-303		Same as CR-101	Diode for V-303
CR-304		Same as CR-101	Diode for V-304
CR-305 thru CR-400		Not Used	

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
CR-401		Same as CR-101	Diode for V-401B
CR-402		Same as CR-101	Diode for V-401A
CR-403		Same as CR-101	Feedback Diode for V-402
CR-404		Same as CR-101	Diode for V-402B
CR-405		Same as CR-101	Diode for V-402A
CR-406		Same as CR-101	Feedback Diode for V-403
CR-407		Same as CR-101	Diode for V-403B
CR-408		Same as CR-101	Diode for V-403A
CR-409		Same as CR-101	Diode for V-404B
CR-410		Same as CR-101	Diode for V-404A
CR-411 thru CR-500		Not Used	
CR-501		Same as CR-101	Diode for V-501B
CR-502		Same as CR-101	Diode for V-501A
CR-503		Not Used on equipments w/serial no. 1 through 1197 Same as CR-101 on equipments w/serial no. 1198 and above	Feedback Diode for V-502
CR-504		Same as CR-101	Diode for V-502B
CR-505		Same as CR-101	Diode for V-502A
CR-506		Not Used on equipments w/serial no. 1 through 1197 Same as CR-101 on equipments w/serial no. 1198 and above	Feedback Diode for V-503
CR-507		Same as CR-101	Diode for V-503B
CR-508		Same as CR-101	Diode for V-503A
CR-509		Same as CR-101	Diode for V-504B
CR-510		Same as CR-101	Diode for V-504A
CR-511 thru CR-600		Not Used	
CR-601		Same as CR-101	Diode for V-601B
CR-602		Same as CR-101	Diode for V-601A
CR-603		Not Used	
CR-604		Same as CR-101	Diode for V-602B
CR-605		Same as CR-101	Diode for V-602A
CR-606		Not Used	
CR-607		Same as CR-101	Diode for V-603B
CR-608		Same as CR-101	Diode for V-603A
CR-609		Same as CR-101	Diode for V-604B
CR-610		Same as CR-101	Diode for V-604A

CR-611 thru CR-700		Not Used	
CR-701		Same as CR-101	Diode for V-701B
CR-702		Same as CR-101	Diode for V-701A
CR-703		Same as CR-101	Diode for V-702B
CR-704		Same as CR-101	Diode for V-702A
CR-705		Same as CR-101	Isolating Diode for V-703
CR-706 thru CR-900		Not Used	
CR-901		Same as CR-101	Diode for V-901
CR-902		Same as CR-101	Diode for V-902
CR-903		Same as CR-101	Diode for V-905A
CR-904		Same as CR-101	Diode for V-905B
CR-905		Same as CR-101	Diode for V-903B
CR-906 thru CR-1000		Not Used	
CR-1001	3H4860-255 N17-R-51402-7246	RECTIFIER, METALLIC: selenium; designed for single phase full wave bridge circuit; input 122 volts rms, single phase; output 130 volts DC into capacitive load, 210 ma; full wave rectification; rectangular; 3 7/16 in. lg by 1 3/16 in. wide by 2 1/8 in. high overall; four 5/16 in. by 5/32 in. oval mounting holes on 3 in. by 1/2 in. mounting centers; four terminals, solder lug type, located on top; moisture proof; RCA part/dwg C-746218-1	DC Power Rectifier
CR-1002		Not Used	
CR-1003		Same as CR-1001	DC Blower Power Rectifier
E-101	3F2445-573-1 N16-C-14435-1028	SYNCHRONIZER, ELECTRICAL: receives trigger from radar being tested; input—three pulses: 10 v, 20 v, 5.5 v; 1 output signal, pulse type 100 microseconds duration, 20 v; 1 output signal, pulse type 100 microseconds, 60 v; 1 output signal, pulse type 10 microseconds; 2.2 v; 1 output signal, pulse type variable duration, 110 v; 1 output signal, pulse type 1 microsecond, 22 v; operating power: 6.3 v 1.3 amp, 50 to 1000 cycles single phase, 8.19 v-amp AC, 150 v 15 ma DC; 8.443 in. lg by 5.395 in. wide by 7/8 in. high overall approx; rack mounted, secured by a Camloc fastener Catalog no. 2600-3 on each end; corrosion resistant steel (stainless) rack holds phenolic plastic board laminated steel passivated treated; c/o 1 oscillator subassembly, RCA part/dwg A-8823450-501; 1 amplifier trigger, RCA part/dwg A-8823451-501; 1 oscillator subassembly, RCA part/dwg A-8823452-501; for producing internal pulses used to calibrate accuracy of range with electronic markers; RCA part/dwg A-8823468-501	Trigger Circuits
E-102	3F2445-573-2 *	OSCILLATOR SUBASSEMBLY: c/o 1 mounting board, RCA part/dwg B-462780; 1 vacuum tube 6BF7; 1 spring, 1 fastener, 2 resistors, 5 capacitors; 2 5/8 in. lg by 2 5/16 in. wide by 7/8 in. high overall; uses Dzus fastener type AJ3 located in 0.228 in. dia hole on raised area of board 1.343 in. by 1.56175 in. mounting center; used as a trigger multivibrator; RCA part/dwg A-8823450-501	Trigger Multivibrator
E-102A	3Z770-17.31 N17-B-78137-3814	TERMINAL BOARD: molded phenolic; 17 terminals, miniature swaged feedthrough type; w/o barriers; 2 5/8 in. lg by 2 5/16 in. wide by 1 1/4 in. thick overall; mounts by plugging into receptacle, held securely in place by single Dzus fastener; incl tube shield; RCA part/dwg C-748005-501	Spare Terminal Board, Less Electrical Components, for E-102
E-103	3F2445-573-3 *	AMPLIFIER, SUBASSEMBLY: c/o 6 resistors, 1 capacitor, 1 diode germanium rectifier, 1 sub-miniature vacuum tube 6BF7; 1 sub-miniature vacuum tube 5902; 2 5/8 in. lg by 2 in. wide by 7/8 in. high overall; mounts by Dzus fastener type AJ3, located on raised surface on 1.343 in. by 1.56175 in. mounting center; sends signals to the main trigger circuit and acts as a cathode follower; RCA part/dwg A-8823451-501	Trigger Amplifier
E-103A	3Z770-18.88 N17-B-78112-9721	TERMINAL BOARD: molded phenolic; 18 terminals, miniature swaged feedthrough stud type; w/o barriers; 2 5/8 in. lg by 2 in. wide by 1 1/4 in. thick overall; mounts by plugging into receptacle, held securely in place by single Dzus fastener; incl two tube shields; RCA part/dwg C-748003-501	Spare Terminal Board, Less Electrical Components, for E-103

CONTRACT NObsr-52327

* Low Failure item—if required requisition from ESO referencing NavShips 900, 180A.

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
E-104	3F2445-573-4 *	OSCILLATOR SUBASSEMBLY: c/o 1 mounting board, RCA part/dwg B-462780, 1 vacuum tube 6BF7, 1 spring, 1 fastener, 4 resistors, 1 capacitor; 2⅝ in. lg by 2$\frac{5}{16}$ in. wide by ⅞ in. high overall; uses Dzus fastener type AJ3, located in 0.228 in. dia hole on raised area of board 1.343 in. by 1.56175 in. mounting center; used as a blocking oscillator; RCA part/dwg A-8823452-501	Blocking Oscillator
E-104A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-104
E-105 thru E-200		Not Used	
E-201	3F2445-573-5 N16-C-14435-1026	OSCILLATOR, RADIO FREQUENCY: 6.5 megacycles, 1 band; Hartley circuit; 6.3 v 1.3 amps, 50 to 1000 cycles, single phase, 8.19 v-amp AC; 130 v, 15 ma DC; external power supply; integral coils; 8.7559 in. lg by 5.61 in. wide by ⅞ in. high overall; rack mounted, secured by one fastener on ea. end Camloc Catalog no. 2600-4; board made of plastic laminated phenolic resin black color secured to support of corrosion resistant sheet steel (stainless) passivation treatment finish; c/o 1 oscillator subassembly, RCA part/dwg A-8824392-501, 1 gate electronic, RCA part/dwg A-8823047-501, 1 oscillator subassembly, RCA part/dwg A-8823019-503; RCA part/dwg A-8823471-501	Oscillator Circuit
E-202	3F2445-573-6 *	OSCILLATOR SUBASSEMBLY: c/o 1 mounting board, RCA part/dwg B-463409-501, 1 vacuum tube 5784, 11 terminals, 1 fastener, 1 spring, 4 resistors, 2 capacitors, 1 crystal unit; 2⅝ in. lg by 2$\frac{5}{16}$ in. wide by ⅞ in. high overall: one 0.228 in. dia mounting hole on raised portion of board 1.343 in. by 1.56175 in. mounting center; containing Dzus fastener type AJ3; works as an oscillator; RCA part/dwg A-8824392-501	Oscillator
E-202A	3Z770-11.42 N17-B-78083-1517	TERMINAL BOARD: molded phenolic; 11 terminals, miniature swaged feedthrough type; w/o barriers; 2⅝ in. lg by 2$\frac{5}{16}$ in. wide by 1¼ in. thick overall; mounts by plugging into receptacle, held securely in place by single Dzus fastener; incl tube shield; RCA part/dwg C-748006-501	Spare Terminal Board, Less Electrical Components, for E-202
E-203	3F2445-573-7 *	OSCILLATOR, SUBASSEMBLY: c/o 1 mounting board, 1 fastener, 1 vacuum tube type 5784, 6 resistors, 17 terminals, 1 peaking coil, 4 capacitors, 2⅝ in. lg by 2$\frac{5}{16}$ in. wide by ⅞ in. high overall; mounts by Dzus fastener type AJ3, located on raised surface on 1.343 in. by 1.56175 in. mounting center; crystal-grid type oscillator; acts as a gate permitting passage of signals at fixed intervals of time; RCA part/dwg A-8823047-501	Oscillator Gate
E-203A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-203
E-204	3F2445-573-8 *	OSCILLATOR SUBASSEMBLY: c/o 1 mounting board, RCA part/dwg B-462780, 1 vacuum tube 6BF7, 17 terminals, 9 resistors, 1 spring, 1 fastener, 2 capacitors, 2 diode, germanium G.E. type G5S3; 2⅝ in. lg by 2$\frac{15}{16}$ in. wide by ⅞ in. high overall; mounts by Dzus fastener, type AJ3, located in 0.228 in. dia hole on raised area of board 1.343 in. by 1.56175 in. mounting center; this subassembly is a multivibrator circuit and acts as an electronic gate; RCA part/dwg A-8823019-503	Gate Multivibrator
E-204A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-204
E-205 thru E-300		Not Used	
E-301	3F2445-573-9 N16-C-14435-1016	CALIBRATOR SET, RANGE: cathode ray tube indication; 6.3 v and 1.8 amp, 50 to 1000 cycles single phase, 11.34 v-amp AC; 130 v, 28 ma DC; rack mounted, secured by one fastener assembly, Camloc Catalog No. 2600-3 ea end; c/o 1 mounting board, 2 supports, 2 variable resistors, 2 receptacles, 43 contacts, 1 connector receptacle; two input voltages, 1.9 v, 0.1 microsecond duration, 22.5 v, 10 microseconds duration; one output voltage, 5 v 0.1 microsecond duration; 9$\frac{7}{64}$ in. lg by 4.168 in. wide by ⅞ in. high overall; high speed counting circuit; RCA part/dwg A-8823096-501	High Speed Counters

E-302	3F2445-573-10 *	CALIBRATOR SET, RANGE: cathode ray tube indication; 6.3 v, 50 to 1000 cycles single phase, 11.34 v-amp AC; 130 v, 28 ma DC; mounts by Dzus fastener type AJ3; c/o 1 mounting board RCA part/dwg B-426766-501, 2 vacuum tubes type 5840, 11 resistors, 2 capacitors, 2 diode germanium, 2 peaking coils, 1 fastener, 14 terminals; high speed counting circuit; 3¾ in. lg by 2⅝ in. wide by ⅞ in. high overall; accepts pulses and sends pulses; RCA part/dwg A-8823040-501	Two to One Counter
E-302A	3Z770-14.95 N17-B-78157-8916	TERMINAL BOARD: molded phenolic; 14 terminals, miniature swaged feedthrough stud type; w/o barriers; 3¾ in. lg by 2⅝ in. wide by 1¼ in. thick overall; mounts by plugging into receptacle, held securely in place by single Dzus fastener; incl two tube shields; RCA part/dwg C-748004-501	Spare Terminal Board, Less Electrical Components, for E-302
E-303		Same as E-302	Two to One Counter
E-303A		Same as E-302A	Spare Terminal Board, Less Electrical Components, for E-303
E-304 thru E-400		Not Used	
E-401	3F2445-573-11 N16-C-14435-1012	CALIBRATOR SET, RANGE: cathode ray tube indication; 6.3 v and 1.2 amp, 50 to 1000 cycles single phase, 7.66 v-amp AC; 130 v, 20 ma DC; 20 ma; rack mounted, secured by Camloc fastener Catalog No. 2600-3 one ea end; c/o 4 receptacles, 1 connector receptacle, 4 springs, 82 contacts, 1 variable resistor, 2 Camloc fastener assembly, 13 capacitors, 4 resistors, 2 diode germanium; 11⅛ in. lg by 4 9/32 in. wide by ⅞ in. high overall; accepts pulses and puts out one pulse for every ten pulses received, internal function decade counter for 100-yard range calibration; RCA part/dwg A-8823094-501	100 Yard Decade
E-402	3F2445-573-12 *	CALIBRATOR SET, RANGE: cathode ray tube indication; 6.3 v, 50 to 1000 cycles single phase, 7.66 v-amp AC; mounts by Dzus fastener type AJ3, located on raised area of mounting board 1.343 in. by 1.56175 in. mounting center; c/o 1 fastener, 1 mounting board, 1 vacuum tube type 6BF7, 10 resistors, 3 capacitors, 2 diode germanium; phenolic plastic laminated board; 2⅝ in. lg by 2 5/16 in. wide by ⅞ in. high overall; sends a pulse internally; RCA part/dwg A-8823019-502	1st Binary of 100 Yard Decade
E-402A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-402
E-403	3F2445-573-13 N16-C-14435-1025	CALIBRATOR SET, RANGE: cathode ray tube indication; operating power; 6.3 v, 50 to 1000 cycles single phase, 7.66 v-amp AC; mounts by Dzus fastener type AJ3, located on raised surface of mounting board 1.343 in. by 1.56175 in. mounting center; c/o 1 mounting board, 1 fastener, 1 vacuum tube type 6BF7, 10 resistors, 3 capacitors, 2 diode germanium; material laminated phenolic plastic; 2⅝ in. lg by 2 5/16 in. wide by ⅞ in. high overall; binary counters send one pulse after receiving one pulse internal function; RCA part/dwg A-8823019-501—Used on equipments w/serial no. 1 through 1197 Same as E-402 on equipments w/serial no. 1198 and above	2nd Binary of 100 Yard Decade
E-403A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-403
E-404		Same as E-403	3rd Binary of 100 Yard Decade
E-404A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-404
E-405		Same as E-403	4th Binary of 100 Yard Decade
E-405A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-405
E-406 thru E-500		Not Used	
E-501	3F2445-573-14 N16-C-14435-1013	CALIBRATOR SET, RANGE: cathode ray tube indication; 6.3 v 1.2 amp, 50 to 1000 cycles single phase, 7.56 v-amp AC; 130 v 20 ma DC; rack mounted, secured by one Camloc fastener Catalog No. 2600-3 ea end; c/o 1 mounting board, 1 variable resistor, 4 receptacles, 1 connector receptacle, 2 fastener assembly, 4 springs, 82 contacts, 12 capacitors, 5 resistors, 2 diode germanium; 11⅛ in. lg by 4 9/32 in. wide by ⅞ in. high overall; accepts pulses and puts out one for every ten received, decade counter internal function for 1000 yard range calibration; RCA part/dwg A-8823094-502	1000 Yard Decade
E-502		Same as E-403	1st Binary of 1000 Yard Decade
E-502A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-502

CONTRACT NObsr-52327

* Low Failure item—if required requisition from ESO referencing NavShips 900, 180A.

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
E-503		Same as E-403	2nd Binary of 1000 Yard Decade
E-503A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-503
E-504		Same as E-403	3rd Binary of 1000 Yard Decade
E-504A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-504
E-505		Same as E-403	4th Binary of 1000 Yard Decade
E-505A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-505
E-506 thru E-600		Not Used	
E-601	3F2445-573-15 N16-C-14435-1014	CALIBRATOR SET, RANGE: cathode ray tube indication; 6.3 v and 1.2 amp, 50 to 1000 cycles single phase, 7.66 v-amp AC; 130 v 20 ma DC; rack mounted, secured by one Camloc fastener Catalog No. 2600-3 ea end; c/o 82 contacts, 1 mounting board, 4 springs, 1 variable resistor, 4 receptacles, 1 receptacle connector, 2 fastener assembly, 12 capacitors, 5 resistors, 2 diode germanium; 11⅛ in. lg by 4$\frac{9}{32}$ in. wide by ⅞ in. high overall; receives and sends out pulses for 10,000 yard range calibration; RCA part/dwg A-8823094-503	10,000 Yard Decade
E-602		Same as E-403	1st Binary of 10,000 Yard Decade
E-602A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-602
E-603		Same as E-403	2nd Binary of 10,000 Yard Decade
E-603A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-603
E-604		Same as E-403	3rd Binary of 10,000 Yard Decade
E-604A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-604
E-605		Same as E-403	4th Binary of 10,000 Yard Decade
E-605A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-605
E-606 thru E-700		Not Used	
E-701	3F2445-573-16 N16-C-14435-1015	CALIBRATOR SET, RANGE: cathode ray tube indication; 6.3 v and 1.2 amp, 50 to 1000 cycles single phase, 9.45 v-amp AC; 130 v 16 ma DC; rack mounted, secured by one Camloc fastener Catalog No. 2600-4 ea end; c/o 1 mounting board, 75 contacts, 4 springs, 3 receptacles, 1 connector receptacle, 2 fastener assembly; 11⅛ in. lg by 3$\frac{57}{64}$ in. wide by ⅞ in. high overall; receives and sends out pulses for 100,000 yard calibration; RCA part/dwg A-8823095-501	100,000 Yard Binaries and Reset Circuit
E-702		Same as E-403	1st 100,000 Yard Binary
E-702A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-702
E-703		Same as E-403	2nd 100,000 Yard Binary
E-703A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-703

E-704	3F2445-573-17 *	AMPLIFIER SUBASSEMBLY: c/o 1 mounting board, 1 fastener, 1 vacuum tube, 17 terminals, 6 resistors, 2 capacitors; 2⅝ in. lg by 2 5/16 in. wide by ⅞ in. high overall; mounts by Dzus fastener type AJ3, located on raised surface on 1.343 in. by 1.56175 in. mounting center; reset multivibrator in delay mechanism circuit; RCA part/dwg A-8823023-501	Reset Multivibrator
E-704A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-704
E-705	3F2445-573-18 *	AMPLIFIER SUBASSEMBLY: c/o 1 mounting board, 1 fastener, 18 terminals, 2 vacuum tubes, 1 capacitor, 5 resistors; 2⅝ in. lg by 2 in. wide by ⅞ in. high overall; mounts by Dzus fastener type AJ3 located on raised surface on 1.343 in. by 1.56175 in. mounting center; reset amplifier in delay mechanism circuit; RCA part/dwg A-8823035-501	Reset Amplifiers
E-705A		Same as E-103A	Spare Terminal Board, Less Electrical Components, for E-705
E-706 thru E-800		Not Used	
E-801	3F2445-573-19 N16-C-14435-1019	ELECTRONIC TIMING GROUP: 6.3 v AC; sq wave shapes varying width; 5 input signals: 4 v, 10 v, 12 v, 14 v, and 17 v; 6.3 v 1.2 amp, 50 to 1000 cycles single phase, 7.56 v-amp AC; 130 v 12.5 ma DC; rack mounted, secured by Camloc fastener assembly type 2600-4; 8⅛ in. lg by 4.982 in. wide by ⅞ in. high overall; 1 connector-receptacle RCA part/dwg B-458573-2, 2 fastener assembly RCA part/dwg B-449642-4, 3 receptacle RCA part/dwg C-746282-1, 1 ea variable resistor RCA part/dwg C-737887-6, RCA part/dwg C-737887-7, RCA part/dwg C-737887-8; 1 mounting board RCA part/dwg C-746505-1, and C-746270-1; 1 support RCA part/dwg C-746276-501; 1 support RCA part/dwg C-746273-501; 1 spring RCA part/dwg C-745484-2; 53 contact RCA part/dwg B-462794-1; coincidence circuit receiving pulse formed in counting circuits; RCA part/dwg A-8823469-501	Coincidence Circuit
E-802	3F2445-573-20 *	ELECTRONIC TIMING GROUP: operates in direct circuit with E-801 and is part of this unit; electrical values for E-801, RCA part/dwg A-8823469-501 control this component; 6.3 v, 50 to 1000 cycles single phase AC; mounted by one Dzus fastener type AJ3 on 1.343 in. by 1.56175 in. mounting center, located on raised surface of board; 2⅝ in. lg by 2 5/16 in. wide by ⅞ in. high overall; c/o 1 mounting board RCA part/dwg B-462780-501; 17 terminal RCA part/dwg A-8822601-1; 1 fastener RCA part/dwg C-745484-1; 1 vacuum tube type 6BF7; 1 resistor RCA part/dwg P-722318-78; 1 resistor RCA part/dwg A-8835333-645; 1 resistor RCA part/dwg P-722318-54; 1 capacitor RCA part/dwg B-458528-12; 1 peaking coil RCA part/dwg C-746521-2; acts as amplifier; RCA part/dwg A-8823446-501	Coincidence Amplifier
E-802A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-802
E-803	3F2445-573-22 *	ELECTRONIC TIMING GROUP: the electrical values of E-801, apply to this component which is p/o the entire unit; requires 6.3 v AC at 50 to 1000 cycles, single phase; mounts by Dzus fastener, type AJ3, located on raised surface of board, on a 1.56175 in. by 0.99975 in. mounting center material laminated phenolic resin board paper base; 2⅝ in. lg by 2 in. wide by ⅞ in. high overall: one mounting board RCA part/dwg B-462779-501, 18 terminals RCA part/dwg A-8822601-1, 1 fastener RCA part/dwg C-745484-1, 1 electron tube JAN type 5784, 1 resistor RCA part/dwg P-722318-78, 1 resistor RCA part/dwg P-722318-80; mixer clipper circuit receives pulse and eliminates the base of the pulse utilizing only the crest; RCA part/dwg A-8823026-502	Coincidence Mixer and Clipper
E-803A	3Z770-18.87 N17-B-78112-9720	TERMINAL BOARD: molded phenolic; 18 terminals, miniature swaged feedthrough stud type; w/o barriers; 2⅝ in. lg by 2 in. wide by 1¼ in. thick overall; mounts by plugging into receptacle, held securely in place by single Dzus fastener; incl tube shield: RCA part/dwg C-748002-501	Spare Terminal Board, Less Electrical Components, for E-803
E-804	3F2445-573-21 *	SYNCHRONIZER, ELECTRICAL: receives output signal from this calibrator and a radar; electrical values of E-801, apply to this component which is p/o the entire unit; requires 6.3 v AC at 50 to 1000 cycles, single phase, 7.56 v-amp; 2⅝ in. lg by 2 in. wide by ⅞ in. high overall; mounts by Dzus fastener, type AJ3, located on raised surface of board on a 1.56175 in. by 0.99975 in. mounting center; material laminated phenolic resin board, paper base; accessories consisting of: 18 terminals RCA part/dwg A-8822601-1, 1 fastener RCA part/dwg C-745484-1, 1 mounting board RCA part/dwg B-462779-501, 1 electron tube JAN type 5784, 1 resistor RCA part/dwg P-722318-82, 1 resistor RCA part/dwg P-722318-86, 1 resistor RCA part/dwg P-722318-92, 1 resistor RCA part/dwg A-8835333-640, 2 capacitors RCA part/dwg B-449696-55, 1 capacitor RCA part/dwg B-458528-201; a comparator mixer receiving a pulse from a radar and an internal pulse from the calibrator circuit and supplying the comparator multivibrator with the response of the two pulses; RCA part/dwg A-8823026-501	Comparator Mixer
E-804A		Same as E-803A	Spare Terminal Board, Less Electrical Components, for E-804

CONTRACT NObsr-52327

* Low Failure item—if required requisition from ESO referencing NavShips 900, 180A.

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
E-805 thru E-900		Not Used	
E-901	3F2445-573-23 N16-C-14435-1020	ELECTRONIC TIMING GROUP: three input pulses, 22 v, 4.3 v, 4 v, 0.6 microsecond input pulsewidth; one output pulse 10 v, 0.6 microsecond pulsewidth; 6.3 v 1.5 amps, 50 to 1000 cycles single phase, 9.45 v-amp AC; 130 v 15 ma DC; rack mounted with one Camloc fastener Catalog no. 2600-3 ea end; approx 9⅛ in. lg by 5.618 in. wide by ⅞ in. high overall; 1 board RCA part/dwg C-746592-1; 56 contact RCA part/dwg B-462794-1 (Cinch Mfg. Co. no. 562); 3 spring RCA part/dwg C-745484-2; 2 receptacle RCA part/dwg C-746292-1; 1 connector receptacle RCA part/dwg B-458573-2; 2 capacitor RCA part/dwg B-458528-13; 2 capacitor RCA part/dwg B-458528-12; 1 capacitor RCA part/dwg B-458528-17; 1 capacitor RCA part/dwg B-458528-7; 1 capacitor RCA part/dwg B-458528-15; 1 capacitor RCA part/dwg B-449696-55; 1 ea resistor RCA part/dwg P-722318-86, 63, 91; 2 resistor RCA part/dwg P-722318-78; 1 ea resistor RCA part/dwg A-8835333-165, 211; RCA part/dwg A-8823472-501	Dither Circuit
E-902	3F2445-573-24 *	TEST SET SUBASSEMBLY: c/o 14 terminals, 1 mounting board, 1 fastener, 1 vacuum tube type 5840, 11 resistors, 2 capacitors, 2 diode germanium, 2 peaking coils; 3¾ in. lg by 2⅝ in. wide by ⅞ in. high overall; mounts by Dzus fastener type AJ3, located on raised surface on 1.87475 in. by 1.56175 in. mounting center; laminated phenolic resin paper base; multivibrator used in a timing circuit; RCA part/dwg A-8823040-502	Dither Multivibrator
E-902A		Same as E-302A	Spare Terminal Board, Less Electrical Components, for E-902
E-903	3F2445-573-25 *	OSCILLATOR SUBASSEMBLY: c/o Dzus fastener type AJ3, 1 mounting board, 1 vacuum tube type 6BF7, 2 resistors; 2⅝ in. lg by 2 in. wide by ⅞ in. high overall; mounts by Dzus fastener type AJ3 on raised surface 1.56175 in. by 0.99975 in. mounting center; mounting board laminated phenolic resin paper base; p/o counting or timing circuit; RCA part/dwg A-8824393-501	Dither Integrator
E-903A		Same as E-803A	Spare Terminal Board, Less Electrical Components, for E-903
E-904	3F2445-573-26 *	TEST SET SUBASSEMBLY: c/o 1 mounting board, 1 fastener, 1 vacuum tube 6BF7, 7 resistors, 2 capacitors, 2 diode germanium; 2⅝ in. lg by 2 5/16 in. wide by ⅞ in. high overall; mounts by Dzus fastener type AJ3 on raised surface 1.343 in. by 1.56175 in. mounting center; comparator multivibrator aligns electrical signals to determine proper calibrated range and light on the calibrator of which this item is a part is illuminated by this circuit when the pulse from the radar and the pulse from the calibrator are matched to the same calibrated distance; RCA part/dwg A-8824394-501	Comparator Multivibrator
E-904A		Same as E-102A	Spare Terminal Board, Less Electrical Components, for E-904
E-905	2Z5888-5 G17-L-6806-130	LAMP GLOW: 65 v AC striking voltage, 90 v DC striking voltage; miniature bayonet base lamp; T-3-1/4 clear, white, 1 filament; 1 3/16 in. max overall height; over 25 hours rated life; any burning position; neon gas; external resistance required 200,000 ohms for 120 v or 500,000 ohms for 230 v; GE Mazda no. NE-51; RCA part/dwg K-872291-9	Lamp for I-901
E-906 thru E-1000		Not Used	
E-1001	3Z770-16.87 N17-B-78085-9760	TERMINAL BOARD: molded bakelite; 16 terminals, single solder lug, double screw type; barrier type; 6 5/8 in. lg by 1 3/64 in. wide by 1 3/32 in. thick overall; four 0.160 in. dia mounting holes on 5/16 in. by 6⅜ in. mounting centers; links and screws brass nickel plated; terminals brass, hot solder dipped; H. B Jones Catalog no. 16-140-3/4 W; RCA part/dwg A-8827059-1	Power and Ground Termination
E-1002		Not Used	
E-1003	3Z10474 N17-T-28255-8501	TERMINAL STUD: solder connection; brass; hot solder dipped, melamine insulation asbestos filled; 30/32 in. lg by ¼ in. dia; mounts w/ no. 4-40 threaded stud, 7/32 in. lg threaded stud brass cadmium plated; metal parts to withstand 100 hr salt spray test; standoff terminals; Winchester Co. Catalog no. 765; RCA part/dwg A-8890637-4	Termination for C-1004

E-1004		Same as E-1003	Termination for C-1007
E-1005		Same as E-1003	Wire termination
E-1006		Same as E-1003	Wire termination
E-1007		Same as E-1003	Termination for S-1002
E-1008		Same as E-1003	Termination for S-1002
E-1009		Same as E-1003	Termination for R-122
E-1010		Same as E-1003	Termination for R-122
E-1011		Same as E-1003	Termination for R-119
E-1012		Same as E-1003	Termination for R-118 and R-119
E-1013		Same as E-1003	Termination for R-118
E-1014		Same as E-1003	Termination for C-805
E-1015		Same as E-1003	Termination for C-428 and C-429
E-1016		Same as E-1003	Termination for C-526 and C-527
E-1017		Same as E-1003	Termination for C-625 and C-626
E-1018		Same as E-1003	Termination for C-713
E-1019		Same as E-1003	Wire Termination
E-1020	3Z12050-5.4 N17-T-26711-9892	TERMINAL, LUG: ring type; brass, hot tin dipped; for 0.132 in. dia wire; 5/8 in. lg by 9/32 in. O D ring by 0.036 in. thick overall; solder connects to wire; Pat-Mac Guyer type no. 2040 (modified); RCA part/dwg K-818337-8	Wiring Lug
E-1021	3Z12101-11.1 N17-T-28236-4107	TERMINAL STUD: post type; brass, hot solder dipped; one undercut for no. 9 AWG wire, one undercut for no. 12 AWG wire; 11/16 in. lg by 1/4 in. across flats overall; solder connects to wire: no. 6-32 by 1/4 in. deep axial mounting hole in end of hex base; base 25/64 in. lg; lug portion 0.093 in. dia by 19/64 in. lg w/ one head and one collar ea 0.156 in. dia by 0.092 in. wide; RCA part/dwg K-891758-1	Ground Post
E-1022	2Z9052-122 ■	STRAP, CONNECTOR: acts as jumper between terminal and terminal strip; brass, nickel plated; L-shape; 2 1/2 in. lg by 1/2 in. wide by 7/32 in. high by 0.032 in. thick overall; mounted by seven 0.147 in. dia holes spaced 3/8 in. C to C to Jones strip; seven tabs 1/4 in. wide by 1/2 in. lg w/ seven 0.147 in. dia holes 1/8 in. from end of tab, one hole in ea tab; other side w/flange 2 1/2 in. lg by 7/32 in. high, 3/16 in. radius on end of ea tab 0.147 in. dia holes spaced 3/8 in. C to C; RCA part/dwg A-8824883-4	Couples Terminal Points on E-1001
E-1023	2Z9052-123 ■	STRAP, CONNECTOR: jumper between terminal and terminal strip; brass, nickel plated; L-shape; 1 in. lg by 1/2 in. wide by 7/32 in. high by 0.032 in. thick overall; mounted by three 0.147 in. dia holes spaced 3/8 in. C to C of ea hole to Jones strip; three tabs, 1/4 in. wide by 1/2 in. lg w/ three 0.147 in. dia holes 1/8 in. from end of tabs, one hole in ea tab; other side w/flange 1 in. lg by 7/32 in. high; 3/16 in. radius on end of ea tab; RCA part/dwg A-8824883-2	Couples Terminal Points on E-1001
E-1024	3Z12059-54 N17-T-26653-4296	TERMINAL, LUG: straight type; brass, hot tin dipped; for no. 12 AWG wire; 5/8 in. lg by 0.250 in. wide by 0.018 in. thick overall; has 0.123 in. dia max mounting hole in one end and one 0.080 in. dia hole for wire in other end; solder connects to wire; Shakeproof Catalog no. 2522-4; RCA part/dwg K-67592-2	Wiring Lug
E-1025	3Z12073-41.44 N17-T-26683-4685	TERMINAL, LUG: straight type; brass, hot tin dipped; for no. 13 AWG wire; 7/8 in. lg by 5/16 in. wide by 0.02 in. thick overall; one 0.14 in. dia mounting hole in one end and one 3/32 in. dia hole for wire in other end; solder connects to wire; Shakeproof Catalog no. 2523-6; RCA part/dwg K-67592-8	Wiring Lug
E-1026		Same as E-1003	Termination for CR-102 and CR-104
E-1027		Same as E-1003	Termination for CR-103
E-1028 thru E-1038		Not Used	
E-1039		Same as E-905	Lamp for I-1001

CONTRACT NObsr-52327

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TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
E-1040	3Z770-20.65 *	TERMINAL BOARD: plastic phenolic resin, paper base, black, laminated; 20 terminals, miniature, swaged; w/o barriers; 4 1/16 in lg by 1 1/4 in. wide by 3/8 in. high overall; two 0.173 in. dia mounting holes on 3 3/8 in. by 5/8 in. mounting centers; board marked E-1040, R-101 to R-105 and R-108 to R-112; terminals brass hot tin-dip finish; board, less terminals, is moisture and fungus resistant, per spec JAN-T-152; RCA part/dwg A-8824331-501	Resistor Board
F-1001	3Z2603.2 G17-F-16302-120	FUSE, CARTRIDGE: NT no. 28032-3; 3 amp 250 v; time delay; 135% for 1 hour, 200% for 1 min; ferrule type; 1/4 in. lg approx by 1/4 in. dia; enclosed type, glass body; one time; indicating element is visible; 1 1/4 in. lg by 1/4 in. dia; RCA part/dwg K-55544-4	Line Power Fuse
F-1002		Same as F-1001	Line Power Fuse
H-1001 thru H-1039		Not Used	
H-1040	2Z2642.1044 *	CLAMP: brass; white nickel finish; one bolt employed; 1 1/16 in. lg approx by 1/2 in. wide by 3/8 in. high approx; 0.147 in. dia mounting hole located 1/4 in. from flat end and 1/4 in. from edge; accommodates material 11/32 in. dia; RCA part/dwg M-95437-104	Clamps Wiring to A-1001
H-1041	2Z2642.1043 *	RETAINER, ELECTRON TUBE: stainless steel; 2 13/16 in. lg by 1 1/2 in. wide by 9/10 in. high, mounted by bracket w/ one elongated mounting hole 5/16 in. lg by 3/16 in. wide; designed to hold tubular object approx 2 in. dia; clamps capacitor to chassis; Birtcher Corp, no. 926D32; RCA part/dwg B-438114-40	Clamps C-1001 to Chassis
H-1042	3F31480-2 *	HANDLE: for front panel; brass, vulcanized rubber coating; 5 5/16 in. lg by 1 11/32 in. high by 5/16 in. thick overall; two mounting holes no. 10-32 tap by 5/16 in. deep; one in ea end; U-shape; RCA part/dwg B-463136-1	Front Panel Guard Control S-103 and S-401
H-1043	3F30390-3.5 *	SUPPORT, COMPARTMENT: stainless steel, passivating dip; straight shape w/ inverted end brackets in opposite directions; 5 3/4 in. lg by 7/8 in. wide by 29/32 in. high overall; two mounting holes in ea inverted end bracket; pairs of holes 1/2 in. C to C; body 3/8 in. wide; RCA part/dwg B-463148-501	Supports Instruction Book Compartment in Open Position
H-1044	6Z3810-16.19 N42-F-1758-500	FASTENER, SPRINGLOCK: Dzus type AJ3; steel, cadmium plated; 1 1/16 in. lg by 5/16 in. dia overall; mounts w/ 3/16 in. dia bottom section; retained by a grommet and retainer ring (not supplied), u/w a snap spring (not supplied); knurled thumb head 5/16 in. dia by 1/4 in. lg; 100 hr salt spray test: Dzus type AJ3; RCA part/dwg C-745484-1	Locks Male Circuit Boards to Female Boards
H-1045		Not Used	
H-1046	6Z4902-3 *	GROMMET: black synthetic rubber; fits 1/2 in. dia hole; hole 5/16 in. dia by 15/32 in. OD by 3/16 in. thick by 9/16 in. dia overall; Wes Rubco Catalog no. G-1784; RCA part/dwg K-894156-10	Bushes Wiring Hole in A-1001
H-1047	6Z1747-58 *	FASTENER, LATCH: lid to cabinet; steel finish zinc plate under Iridite black; 2 11/32 in. lg by 7/8 in. wide by 1/2 in. high overall; two 0.128 in. dia mounting holes, 1 7/32 in. C to C in body; two 0.144 in. dia mounting holes, 7/8 in. C to C in latch; RCA part/dwg K-895603-3	Fastens Lid to Cabinet
H-1048	2Z2642.1046 *	CLAMP: brass, white nickel finish; one bolt employed; 27/32 in. lg approx by 1/2 in. wide by 19/64 in. high approx, 0.147 in. dia mounting hole located 7/32 in. from flat end and 1/4 in. from edge; accommodates material 1/4 in. dia; RCA part/dwg M-95437-150	Clamps Wiring to A-1001
H-1049	6L6632-10.5SF *	SCREW, MACHINE: slot drive, RH, semi-finished; brass, white nickel plated for threaded surfaces; no. 6-32 thread NC-2; 5/8 in. lg; full thread; RCA part/dwg K-57456-165	
H-1050 thru H-1055		Not Used	
H-1056	2Z2712.88 N17-C-804673-101	CLIP: capacitor mounting; spring steel, cadmium plated: 21/32 in. wide by 23/32 in. high by 19/32 in. lg overall; 11/16 in. max jaw opening; 11/32 in. lg by 5/8 in. ID spring grip for 5/8 in. to 1 1/16 in. dia capacitor, base section 19/32 in. by 9/32 in. for embossure mounting; Prestole no. 500-625; RCA part/dwg A-8898607-10	Mounting for C-1004 and C-1007 to A-1005

H-1057	6L3804-20-7.2 *	NUT, SQUARE: brass, white nickel plated; ¼ in. 20 tap thread; 23/64 in. high overall; 7/16 in. across flats; bottom w/ round undercut shoulder to 0.312 in. dia by ⅜ in. deep; RCA part/dwg K-854830-103	Fastens Front Panel to Case
H-1058	6Z3810-16.18 N42-F-4363-1500	FASTENER, SPRINGLOCK: Camloc type; chassis lock; steel, cadmium plated; 11/16 in. lg by ½ in. dia overall; mounts by ¼ in. dia body; screw head 19/64 in. dia; retaining shoulder ½ in. dia; Camloc Fastener Catalog no. 2600-3; RCA part/dwg B-449642-3	Locks E-101, E-201, E-301, E-401, E-501, E-601, E-701, E-801, E-901 to A-1001
H-1059		CLIP: for fuse; phosphor bronze, black nickel plated under satin black synthetic finish; 5/16 in. lg by 11/32 in. wide by 23/64 in. high overall; for fuse having ¼ in. OD ferrules; RCA part/dwg A-8825263-1	Holder for Spare Fuses
H-1060	2Z2462.822 *	CLAMP: power cable storage; phosphor bronze; black nickel finish under satin black synthetic; 111/32 in. lg by 1⅛ in. high by ⅜ in. wide overall; holds 1⅛ in. dia cable; L-shape w/ part of bottom curved on 9/16 in. radius; upright side has two 0.173 in. dia mounting holes on ¾ in. mounting center; RCA part/dwg A-8847783-1	Support for Power Cable Fittings when Stored
H-1061	3Z1029-14.3 *	CLIP: for fuse; phosphor bronze, black nickel finish under satin black synthetic; ⅝ in. lg by 27/32 in. high by ½ in. wide overall; "U" spring clip; single mounting hole 0.180 in. dia in center of bottom; RCA part/dwg A-8847908-1	Support for Signal Cable Fittings when Stored
H-1062	6Z6012-20 *	HOOK: fastens lid to cabinet; stainless steel, chemical black and black lacquer finish; flat hooked shape; 2 in. lg by 9/16 in. wide by 7/16 in. high overall; two 0.173 in. dia mounting holes on ½ in. mounting center; inside hook dia ⅛ in.; RCA part/dwg A-8847288-1	Fastens Lid to Cabinet
I-901	2Z5991-339 N17-L-99999-11	LIGHT, INDICATOR: supplied w/ lens; ½ in. dia; red; smooth; mounted by ½ in.-24 thread; accommodates T-3-1/4 lamp; miniature bayonet base (NE-51); 125 v, 1/25 w, 0.2 amp; dull black nickel plated brass shell, enclosed; 2¼ in. lg by 15/16 in. dia approx incl hardware; one mounting hole, 11/16 in. dia; for ¼ in. thick panel; horizontally mounted lampholder; lamp replaceable from front panel; two solder lug type terminals, located on end of base; both insulated from shell; resistant to salt water spray; includes built-in resistor for operation w/ neon glow lamp; Dial Light Co. Catalog no. 81408-131; RCA part/dwg C-746515-2	Comparator Indicator
I-901A	2Z6125-223 *	LENS, INDICATOR LIGHT: red; ½ in. dia; hemispherical type; glass, smooth, 11/16 in. lg by ⅝ in. dia overall; mounted in brass bezel, dull black nickel finish; mounting thread 9/16 in.-27, 3/16 in. lg threaded portion; resistant to salt water spray; Dial Light Co., Catalog no. 81-137; RCA part/dwg C-746515-4	Spare Lens for I-901
I-901B	2Z5991-370 N17-L-76652-1301	LIGHT, INDICATOR: w/o lens; accommodates lens ½ in. effective dia; thread type mounting; 9/16 in.-27 thread; T-3¼ lamp; miniature bayonet base; 105-125 v, 1/25 w; brass shell, dull black nickel finish; enclosed; 1¾ in. lg by 13/16 in. dia by 1 in. OD mounting washer, overall; one mounting hole required, 11/16 in. dia; accommodates up to ⅛ in. thick panel; lamp is mounted horizontally and is replaceable from front of panel; two term, solder lug type, located on end; both insulated from shell; resistant to salt water spray; Dial Light Co., Catalog no. 81408; RCA part/dwg C-746515-5	Spare for I-901
I-902 thru I-1000		Not Used	
I-1001	2Z5991-340 N17-L-76737-2637	LIGHT, INDICATOR: supplied w/ lens; ½ in. dia; clear; smooth; mounted by ½ in.-24 thread; accommodates T-3-1/4 lamp; miniature bayonet base (NE-51); 125 v, 1/25 w, 0.2 amp; dull black nickel plated brass shell, enclosed; 2¼ in. lg by 15/16 in. dia approx incl hardware; one mounting hole, 11/16 in. dia; for ¼ in. thick panel; horizontally mounted lampholder; lamp replaceable from front of panel; two solder lug type terminals, located on end of hose; both insulated from shell; resistant to salt water spray; includes built-in resistor for operation w/ neon glow lamp; Dial Light Co. Catalog no. 81408-137; RCA part/dwg C-746515-1	Power Adjustment Indicator
I-1001A	2Z6125-224 N17-L-250177-226	LENS, INDICATOR LIGHT: clear; ½ in. dia; hemispherical type; glass, smooth; 11/16 in. lg by ⅝ in. dia overall; mounted in brass bezel, dull black nickel finish; mounting thread 9/16 in.-27, 3/16 in. lg threaded portion; resistant to salt water spray; The Dial Light Co., Catalog no. 81-137; RCA part/dwg C-746515-3	Spare Lens for I-1001
I-1001B		Same as I-901B	Spare for I-1001
J-101	2Z7390-290 N17-C-73108-1267	CONNECTOR, RECEPTACLE: AN type UG-290/U; one round female contact; straight type; 111/32 in. lg excluding protruding terminals, 11/16 in. wide by 11/16 in. high; 50 ohms nominal impedance; non-constant impedance characteristic; cylindrical body w/ sq mounting flange; brass, silver-plated; thermosetting polymer insert; 0.043 in. dia cable opening; four holes, no. 3-56 tapped, ½ in. by ½ in. mounting centers; Navy dwg no. RE49F331; RCA part/dwg M-445813-1	Connector for Trigger in HI Z
J-102		Same as J-101	Connector for Trigger in LO Z
J-103		Same as J-101	Connector for Output Pulse

CONTRACT NObsr-52327

* Low Failure item—if required requisition from ESO referencing NavShips 900, 180A.

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS / STANDARD NAVY / AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
J-104		Same as J-101	Connector for Output Trigger HI Z
J-105		Same as J-101	Connector for Output Trigger LO Z
J-106		Same as J-101	Connector for Scope Sync.
J-107	2Z3041-16 N17-C-73619-5096	CONNECTOR, RECEPTACLE: 21 round male contacts; polarized; straight type; 2¼ in. lg by ⅝ in. wide by $^{21}/_{32}$ in. high overall; 3100 v breakdown between contacts at sea level (normal humidity); rectangular shape; melamine; two mounting studs w/ no. 4-40 thread, ¼ in. lg; 1.937 in. mounting centers; provided w/ one male guide pin, one female guide pin, and one female guide pin receptacle integral w/ mounting studs; Winchester Electronics Co. Catalog no. MRE 21P-G; RCA part/dwg B-458573-1	Plug for E-101
J-108 thru J-200		Not Used	
J-201		Same as J-107	Plug for E-201
J-202 thru J-300		Not Used	
J-301		Same as J-107	Plug for E-301
J-302 thru J-400		Not Used	
J-401		Same as J-107	Plug for E-401
J-402 thru J-500		Not Used	
J-501		Same as J-107	Plug for E-501
J-502 thru J-600		Not Used	
J-601		Same as J-107	Plug for E-601
J-602 thru J-700		Not Used	
J-701		Same as J-107	Plug for E-701
J-702 thru J-800		Not Used	
J-801		Same as J-107	Plug for E-801
J-802		Same as J-101	Connector for Comparator Input
J-803 thru J-900		Not Used	
J-901		Same as J-107	Plug for E-901
J-902 thru J-1000		Not Used	

J-1001	6Z8364-1 N17-C-73446-3001	CONNECTOR, RECEPTACLE: two flat male contacts; straight type; 2.031 in. lg by 1⅝ in. wide by 1⅛ in. high overall; 125/250 v, 15/20 amps; cylindrical shape; oval mounting flange; brass, corrosion resistant finish; fungus proofed; molded black composition insert; two 0.136 in. dia holes by 1.750 in. mounting centers; Harvey Hubbel Catalog no. 6808 Modified; RCA part/dwg K-897170-2	Input Power Receptacle
L-101	3C1084H-87 N16-C-73273-1553	COIL, RADIO FREQUENCY: 18 microhenries ±10% at 6 mc; 1.9 ohms DC resistance; 49 turns no. 36 AWG; copper conductor; double nylon and enamel covered; one winding, single pie universal winding; untapped; unshielded; powdered iron core; coil dim excluding terminals 7/32 in. dia by ⅜ in. lg; coil form, ⅜ in. lg by 0.107 in. dia overall; two terminals, wire lead type; located axially; terminal mounted; marked w/ blue dot on coil form; radio frequency peaking coil; fungus resistant; −55 deg C to +85 deg C ambient operating temp range; RCA part/dwg C-746521-1	Delay Line
L-102		Same as L-101	Delay Line
L-103		Same as L-101	Delay Line
L-104		Same as L-101	Delay Line
L-105		Same as L-101	Delay Line
L-106		Same as L-101	Delay Line
L-107		Same as L-101	Delay Line
L-108		Same as L-101	Delay Line
L-109		Same as L-101	Delay Line
L-110		Not Used	
L-111	3C1084H-55 N16-C-74331-5346	COIL, RADIO FREQUENCY: 1.0 mh ±5% between 2 and 12 mc; 23 ohms ±10% DC resistance, 50 ma; no. 36 AWG; copper conductor, enamel single nylon covered conductor; one winding, 3 pie universal winding; untapped; unshielded; molded bakelite form, solid molded bakelite core; coil dim, excluding terminals, mounting attachments and tuning devices ½ in. dia by 1 in. ±1/32 in. lg; overall coil form dim, 1 in. lg by ¼ in. dia; two terminals 1½ in. lg solid wire conductor no. 20 AWG, one ea end located axially; radio frequency peaking coil; voltage rating 150 v; tropicalize in accordance w/ Spec JAN-T-152; terminals hot tin dipped and free from all other finishes: Q equals 50 ±20% at 1000 kc; capacity is 2 mmf max; Buships Spec 16C 38 (Ships) Grade A; National Co. Inc. Type R-50; RCA part/dwg K-8889573-2	Peaking Coil for V-102
L-112 thru L-200		Not Used	
L-201	3C1084H-86 N16-C-76645-4812	COIL, RADIO FREQUENCY: 27 to 38 microhenries at 3 mc; 5 ohms max DC resistance; 78 turns total, 26 turns ea pie no. 36 AWG; copper conductor; double nylon and enamel covered; one winding, 3 pie universal winding; untapped; unshielded; phenolic form; powdered iron core; coil dim excluding terminals, mounting attachments, and tuning devices, ⅜ in. dia by ¼ in. thick (3 pies); coil form, 19/32 in. lg approx by ⅜ in. dia by ¾ in. wide overall; adjustable iron core; adjustment by screwdriver slot in core end, and double flatted end on stud; two terminals, solder lug type; located radially on end opposite mounting; ¼ in.-32 by 7/32 in. lg thread at end for single hole mounting; marked with red dot on coil form; oscillator coil; fungus resistant; unit capable of continuous operation with a 20 ma DC current flow; 300 v DC working; ambient operating temperature range −55 deg C to +85 deg C; exposed metal parts to withstand 100 hrs salt spray test; RCA part/dwg C-746608-1	Coil for Oscillator
L-202	3C555-37 N16-C-74035-4635	REACTOR: audio; one section, 3 pie universal winding; 300 microhenries ±10% at 600 kc; 9 ohms max DC resistance; ¼ in. lg by 25/64 in. dia overall; term mounted; two wire lead terminals axially located at ends; fungus resistant; −55 deg C to +85 deg C ambient operating temp range; RCA part/dwg C-746548-1	Choke Coil for V-202
L-203 thru L-300		Not Used	
L-301	3C1084H-89 N16-C-73581-1570	COIL, RADIO FREQUENCY: 52 microhenries ±10% at 2 mc; 2.8 ohms DC resistance; 84 turns no. 36 AWG; copper conductor; double nylon and enamel covered; one winding, single pie universal winding; untapped; unshielded; powdered iron core; coil, excluding terminals 9/32 in. dia by ⅜ in. lg; coil form, ⅜ in. lg by 0.107 in. dia overall; two terminals, wire lead type; located axially; terminal mounted; marked w/ yellow dot on coil form; radio frequency peaking coil; fungus resistant; −55 deg C to +85 deg C ambient operating temp range; RCA part/dwg C-746521-3	Peaking Coil for V-301

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
L-302		Same as L-301	Peaking Coil for V-302
L-303		Same as L-301	Peaking Coil for V-303
L-304		Same as L-301	Peaking Coil for V-304
L-305 thru L-800		Not Used	
L-801	3C1084H-88 N16-C-73488-2399	COIL, RADIO FREQUENCY: 40 microhenries ±10% at 2 mc; 2.5 ohms DC resistance; 74 turns no. 36 AWG; copper conductor; double nylon and enamel covered; one winding, single ple universal winding; untapped; unshielded; powdered iron core; coil, excluding terminals 9/32 in. dia by 3/8 in. lg; coil form, 3/4 in. lg by 0.107 in. dia overall; two terminals, wire lead type; located axially; terminal mounted; marked w/ green dot; radio frequency peaking coil; fungus resistant; −55 deg C to +85 deg C ambient operating temp range; RCA part/dwg C-746521-2	Peaking Coil for V-801
L-802 thru L-900		Not Used	
L-901		Same as L-301	Peaking Coil for V-901
L-902		Same as L-301	Peaking Coil for V-902
L-903 thru L-1000		Not Used	
L-1001	3C555-36 N16-R-28992-4106	REACTOR: filter choke; one section; 2 henries +10% −0 overall inductance; 230 ma DC; 50 ohms DC resistance; 1500 v rms test voltage; hermetically sealed metal case; 3 5/16 in. high by 2 5/16 in. lg by 2 1/16 in. wide excl terminals and mounting; four no. 6-32 by 3/4 in. lg mounting studs on 1 11/16 in. by 1 7/16 in. mounting centers; two solder lug type terminals, located on bottom; marked in accordance w/ MIL-T-27 Para. 3.17.1; −54 deg C to +80 deg C operating temp range; RCA part/dwg C-745460-1	Power Filter Choke
N-1001	2Z3723-428 *	DIAL, SCALE: round; 0 to 10 ccw; 360 deg arc; 1 11/16 in. dia, 3/32 in. wide; 0.251 in. dia hole flatted to 0.220 in. on 90 deg angle; shaft mounted; aluminum; black alumilite on front surface, numbers filled with white lacquer; direct etch; RCA part/dwg A-47421-1	Range Indicator
N-1002	2Z3723-430 *	DIAL, SCALE: round; 0 to 100 ccw; 360 deg arc; 1 11/16 in. dia, 3/32 in. wide; 0.251 in. dia flatted to 0.220 in. on 90 deg angle; shaft mounted; aluminum; black alumilite on front surface, numbers filled with white lacquer; direct etch; RCA part/dwg A-47421-2	Range Indicator
N-1003	2Z3723-429 *	DIAL, SCALE: round; 0 to 3 ccw; 95 deg arc; 1 11/16 in. dia, 3/32 in. wide; 0.251 in. dia hole flatted to 0.220 in. on 90 deg angle; shaft mounted; aluminum; black alumilite on front surface, numbers filled with white lacquer; direct etch; RCA part/dwg A-47421-3	Range Indicator
N-1004	3F6000-1 *	PLATE, IDENTIFICATION: laminated plastic; white etched inscription; black background; inscribed E-1001 and numerals 1 thru 16; 6 31/32 in. lg by 1 1/4 in. wide by 1/32 in. thick overall; three 0.173 in. dia mounting holes spaced 3 3/4 in. and 2 3/4 in. C to C; RCA part/dwg A-8826927-1	Terminal No. Identification for E-1001
O-101 thru O-1000		Not Used	
O-1001	6Z1933-91 *	CLEANER, AIR: wire cloth mesh screen type; stainless steel frame; 6 1/4 in. lg by 2 1/4 in. wire by 0.046 in. thick; not replaceable; eight 0.147 in. dia mounting holes, two rows ea w/ four holes spaced 1 15/16 in., 2 in. and 1 15/16 in. C to C, and spaced 1 7/8 in. between rows; RCA part/dwg B-463139-501	Screens Air Intake Openings in A-1018
O-1002	6Z1933-92 *	CLEANER, AIR: wire cloth mesh screen type; stainless steel frame; 5 7/8 in. lg by 5 7/8 in. wide; not replaceable; eight 0.173 in. dia mounting holes, two on ea edge 2 15/16 in. apart, 1 15/32 in. from end; RCA part/dwg B-463153-501	Screens Air Exhaust Opening in A-1019

O-1003	2Z5822-794 Procured on demand by nearest Naval Shore Supply Activity	KNOB: plastic; black; round; accommodates shaft ¼ in. dia by ½ in deep shaft hole; set screw; brass, nickel plated insert; single white marker line; 1¼ in. lg by ⅞ in. wide (dia) by $21/32$ in. deep overall; c/o rectangular finger grip ½ in. wide by 1¼ in. lg over ⅞ in. dia body; RCA part/dwg B-464113-1	Control S-101 and S-1001
O-1004	2Z5822-795 Procured on demand by nearest Naval Shore Supply Activity	KNOB: plastic; black; round; accommodates shaft ¼ in. dia by ½ in. deep shaft hole; set screw; brass, nickel plated insert; w/o marking; 1¼ in. lg by ⅞ in. wide (dia) by $21/32$ in. deep overall; c/o rectangular finger grip ½ in. wide by 1¼ in. lg over ⅞ in. dia body; RCA part/dwg B-464113-2	Control S-103, S-401, S-501, S-601, S-701, R-129 and R-816
O-1005	2Z4866.551 *	GASKET, water seal; synthetic rubber; single hole; round; 0.340 in. OD by 0.240 in. ID by 0.125 in. thick overall; made per Navy Dwg RE49F380 latest revision; RCA part/dwg K-895807-6	Seal in Fittings of Cables W-1002, W-1003 and W-1004
O-1006	3H5041.3-40 N43-W-7104-3040	RING, RETAINER: retains fastener RCA part/dwg B-449642-3; steel cadmium plated finish; round flat washer shape w/ six internal extrusions equally spaced; ½ in. OD by 0.019 in. thick less taper of extrusions; mounts by ID and OD; u/w ¼ in. dia shaft; Camloc Fastener Catalog no. 2600-W; RCA part/dwg K-8886047-3	Retains Fastener H-1058 in E-101, E-201 E-301, E-401, E-501, E-601, E-701, E-801, E-901
O-1007	6Z7465-43 *	GASKET: for lid; neoprene rubber; single hole; round ring shape; 14½ in. OD; 14 in. ID; ¼ in. OD wall; Shore hardness 70 ±5; color coded; RCA part/dwg K-8859324-7	Provides Seal between Case Body and Lid
O-1008	3H5040-41 N42-R-2052-550	RING, RETAINER: for male fastener used on circuit boards; steel, cadmium plate finish; crescent shape; 0.24 in. OD by 0.015 in. ±0.001 in. thick overall; u/w 0.187 in. dia shaft; 0.161 in. free dia; requires shaft groove 0.165 in. dia by 0.017 in. lg; safety factor of 4 under thrust load of 130 lbs; RCA part/dwg B-449686-102	Retains H-1044 in "Plug-in Boards"
P-100		Not Used	
P-101	2Z3082-119 N17-C-73325-2481	CONNECTOR, RECEPTACLE: 21 round female contact; polarized; straight type; 2¼ in. lg by ⅝ in. wide by $27/32$ in. high overall; 3100 v breakdown between contacts at sea level (normal humidity); rectangular shape; melamine body; two studs w/ no. 4-40 NC 2 thread, ¼ in. lg by 1.937 in. mounting centers; provided w/ one male guide pin, one female guide pin receptacle integral w/ mounting studs; Winchester Electronics Co. Catalog no. MRE 21S-G; RCA part/dwg B-458573-2	Receptacle for E-101
P-102 thru P-200		Not Used	
P-201		Same as P-101	Receptacle for E-201
P-202 thru P-300		Not Used	
P-301		Same as P-101	Receptacle for E-301
P-302 thru P-400		Not Used	
P-401		Same as P-101	Receptacle for E-401
P-402 thru P-500		Not Used	
P-501		Same as P-101	Receptacle for E-501
P-502 thru P-600		Not Used	
P-601		Same as P-101	Receptacle for E-601
P-602 thru P-700		Not Used	
P-701		Same as P-101	Receptacle for E-701
P-702 thru P-800		Not Used	

CONTRACT NObsr-52327

* Low Failure item—if required requisition from ESO referencing NavShips 900, 180A.

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
P-801		Same as P-101	Receptacle for E-801
P-802 thru P-900		Not Used	
P-901		Same as P-101	Receptacle for E-901
P-902 thru P-1000		Not Used	
P-1001	6Z3150-4 N17-C-71126-5833	CONNECTOR, PLUG: two rectangular female contact; straight type; 1.655 in. lg by 1.375 in. dia overall; contact, 250 v 10 amp; cylindrical brass body; corrosion resistant finish; molded black composition insert; 0.625 in. dia max cable opening; includes cable grips; moisture and fungus proof; Harvey Hubbell, Inc. Catalog no. 7257; RCA part/dwg K-897777-2	Power Connector for J-1001
P-1002	6Z1735.6 N17-C-71431-5140	CONNECTOR, PLUG: two rectangular male contact; straight type; 1.718 in. lg by 1.375 in. dia overall; contact, 250 v 10 amp; cylindrical brass body; corrosion resistant finish; molded composition insert; 0.625 in. dia max cable opening; includes cable grips; resistant to 200 hr salt water spray; Harvey Hubbell, Inc. Catalog no. 7357; RCA part/dwg A-8824395-1	Plug for Power Cable
P-1003	2Z7390-260 N17-C-71408-3425	CONNECTOR, PLUG: AN type UG-260/U; one round male contact; straight type; 0.857 in. lg approx by 0.535 in. dia; cylindrical brass body silver plated; styramic insulated insert; 0.258 in. dia; coupling nut opposite cable end w/ ¾ in.-32 thread; incl brass clamp, brass nut, brass washer, body assembly per Navy dwg RE49F380H; RCA part/dwg M-427992-501	Termination for Cable W-1002
P-1004		Same as P-1003	Termination for W-1002
P-1005		Same as P-1003	Termination for W-1003 Cable
P-1006		Same as P-1003	Termination for W-1003 Cable
P-1007		Same as P-1003	Termination for W-1004 Cable
P-1008		Same as P-1003	Termination for W-1004 Cable
R-101	3Z6722-36 N16-R-73221-5551	RESISTOR, FIXED, FILM: 220,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, −0.035% of total resistance per deg C average; $15/32$ in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-71-3140 w/ amendment no. 1; RCA part/dwg A-8835333-206	Grid Resistor for V-101A for 1200 Pulse per Second Repetition Rate
R-102	3Z6662-22 N16-R-73162-1351	RESISTOR, FIXED, FILM: 62,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; $15/32$ in. max lg by 0.155 in. max dia, excluding terminals; insulated; resistant to humidity; two terminals, solid strand axial wire lead type; color coded; Continental Carbon Company Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-170	Grid Resistor for V-101A for 480 Pulse per Second Repetition Rate
R-103	3Z6643-13 N16-R-73142-2951	RESISTOR, FIXED, FILM: 43,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; $15/32$ in. max lg by 0.155 in. max dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-163	Grid Resistor for V-101A for 800 Pulse per Second Repetition Rate
R-104	3Z6622-68 N16-R-73114-2424	RESISTOR, FIXED, FILM: 22,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; $15/32$ in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-153	Grid Resistor for V-101A for 1200 Pulse per Second Repetition Rate

R-105	3Z6575-122 N16-R-73073-7876	RESISTOR, FIXED, FILM: 7500 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resistance temp coefficient, less than 0.02% of total resistance per deg C; 19/32 in. lg by 11/64 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-11	Grid resistor for V-101A for 2400 Pulse per Second Repetition Rate
R-106	3Z6639-29 N16-R-73127-4427	RESISTOR, FIXED, FILM: 33,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; 15/32 in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-71-3140 w/ amendment no. 1; RCA part/dwg A-8835333-158	Plate Resistor for V-101A
R-107		Same as R-106	Plate Resistor for V-101B
R-108	3Z6712-39 N16-R-73196-7338	RESISTOR, FIXED, FILM: 120,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, −0.035% of total resistance per deg C average; 15/32 in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-71-3140 w/ amendment no. 1; RCA part/dwg A-8835333-199	Grid Resistor for V-101B for 160 Pulse per Second Repetition Rate
R-109	3Z6639-33 N16-R-73137-3058	RESISTOR, FIXED, FILM: 39,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; 15/32 in. lg by 0.155 in. dia excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-161	Grid Resistor for V-101B for 480 Pulse per Second Repetition Rate
R-110	3Z6615-175 N16-R-73105-1721	RESISTOR, FIXED, FILM: 15,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.035% of total resistance per deg C; 15/32 in. lg by 0.155 in. dia excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-149	Grid Resistor for V-101B for 800 Pulse per Second Repetition Rate
R-111	3Z6612-83 N16-R-73097-6564	RESISTOR, FIXED, FILM: 12,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; 15/32 in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-147	Grid Resistor for V-101B for 1200 Pulse per Second Repetition Rate
R-112	3Z6568-51 N16-R-73067-8981	RESISTOR, FIXED, FILM: 6800 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resisance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 11/64 in. dia excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-10	Grid Resistor for V-101B for 2400 Pulse per Second Repetition Rate
R-113	3RC20BF223K N16-R-50372-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF223K; 22,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-78	Grid Resistor for V-102
R-114	3Z6270-49 N16-R-73020-8251	RESISTOR, FIXED, FILM: 2700 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 11/64 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-9	Plate Resistor for V-102A
R-115	3RC20BF473K N16-R-50480-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF473K; 47,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec no. JAN-R-11; RCA part/dwg P-722318-82	Grid Resistor for V-102B
R-116	3Z6610-386 N16-R-73092-6731	RESISTOR, FIXED, FILM: 10,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 11/64 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-2	Plate Resistor for V-102B
R-117		Same as R-114	Cathode Resistor for V-101B
R-118	3RC20BF681K N16-R-49841-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF681K; 680 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia; excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-60	Termination Resistor for Trigger IN

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
R-119	3Z6007E5-67 N16-R-72882-1481	RESISTOR, FIXED, FILM: 75 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; 0.060% of total resistance per deg C; 15/32 in. lg by 0.130 in. dia, excluding terminal; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type; 1¼ in. lg; Continental Carbon Co., Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8817630-4	Termination Resistor for Trigger IN LO Z
R-120	3RC20BF104K N16-R-50633-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF104K; 100,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-86	Grid Resistor for V-103
R-121	3Z6100-352 N16-R-72993-5954	RESISTOR, FIXED, FILM: 1000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 1¼ in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-7	Cathode Resistor for V-103
R-122		Same as R-116	Termination Resistor for Output Trigger
R-123		Same as R-110	Cathode Resistor for V-104A
R-124		Same as R-101	Voltage Divider Resistor for Cathode of V-104A
R-125		Same as R-101	Voltage Divider for Cathode of V-104B
R-126		Not Used	
R-127	3Z6030-162 For replacement use N16-R-72931-6458	RESISTOR, FIXED, FILM: 300 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 1¼ in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-13	Termination for Delay Line
R-128		Same as R-116	Cathode Resistor for V-104B
R-129	3Z7225-33 N16-R-87089-2901	RESISTOR, VARIABLE, COMPOSITION: one section; 250 ohms ±10%; 2 w; std "A" taper; three terminals, solder lug type; enclosed metal case; 1 1/16 in. dia by 9/16 in. deep; excluding shaft; metal shaft; flatted, 9/32 in. lg by ¼ in. dia by 5/16 in. lg; normal torque; contact arm insulated; no "off" position; bushing mounted ⅜ in.-32 threads; ¼ in. lg; non-turn device located on 17/32 in. radius at 3 o'clock; will withstand 100 hr 20% salt spray; will withstand 900 v rms 60 cycles between terminal and mounting bushing for 1 minute; operating temperature range −55 deg C to +85 deg C; marked w/ RCA part/ dwg no.; Allen Bradley Co. Type J; RCA part/dwg C-737872-17	Output Trigger Amplitude Adjustment
R-130		Same as R-115	Grid Resistor for V-102
R-131		Not Used	
R-132	3RC20BF103K N16-R-50282-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF103K; 10,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-74	Terminating Resistor for CR-102 and CR-103
R-133	3RC20BF823K N16-R-50588-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF823K; 82,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. max lg by 0.175 in. max dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial single strand wire lead type, 0.028 in. min dia by 1.50 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-85	Shunt Resistor for L-111
R-134 thru R-200		Not Used	
R-201	3RC20BF102K N16-R-49922-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF102K; 1000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-62	Power Filter Resistor for E-201

R-202	3Z6647-51 N16-R-50479-566	RESISTOR, FIXED, FILM: 47,000 ohms ±5%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; 15/32 in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-665	No. 3 Grid Resistor for V-201
R-203	3Z6768-32 N16-R-50893-501	RESISTOR, FIXED, FILM: 0.68 megohm ±5%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; 15/32 in. lg by 0.155 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-725	No. 1 Grid Resistor for V-201
R-204		Same as R-202	No. 2 Grid Resistor for V-201
R-205		Same as R-120	No. 1 Grid Resistor for V-202
R-206	3Z6120-69 For replacement use N16-R-72296-1258	RESISTOR, FIXED, FILM: 1200 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 11/64 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-8.	Cathode Resistor for V-202
R-207	3Z6470-55 For replacement use N16-R-73043-2008	RESISTOR, FIXED, FILM: 4700 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 11/64 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-1	Cathode Resistor for V-202
R-208		Same as R-106	Voltage Divider for Cathode of V-202
R-209	3Z6739-11 N16-R-73258-7041	RESISTOR, FIXED, FILM: 390,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, −0.035% of total resistance per deg C average; 15/32 in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-214	Part of Voltage Divider to No. 3 Grid of V-202
R-210		Same as R-101	Part of Voltage Divider to No. 3 Grid of V-202
R-211	3Z6682-29 N16-R-73196-9151	RESISTOR, FIXED, FILM: 82,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C average; 15/32 in. lg by 0.130 in. dia; excluding terminals; uninsulated; resistant to humidity; two terminals, axial wire lead type, 1¼ in. lg; color coded; Radell Type CD½PR; RCA part/dwg A-8835333-176	Voltage Divider Resistor for V-203B
R-212		Same as R-104	Grid Resistor for V-203B
R-213		Same as R-116	Plate Resistor for V-203A
R-214		Same as R-104	Cathode Resistor for CR-202
R-215	3Z6390-37 N16-R-73033-1751	RESISTOR, FIXED, FILM: 3900 ohms ±1%; ½ w; 350 max working; derated to "0" power at 150 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 11/64 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-8	Cathode Resistor for V-203
R-216		Same as R-116	Plate Resistor for V-203B
R-217		Same as R-104	Cathode Resistor for CR-203
R-218		Same as R-211	Voltage Divider for V-203A
R-219		Same as R-104	Grid Resistor for V-703A
R-220	3RC20BF122K N16-R-49940-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF122K; 1200 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-63	Shunt Resistor for L-202
R-221 thru R-300		Not Used	
R-301	3RC20BF683K N16-R-50552-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF683K; 68,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-84	Isolation Resistor for V-304

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
R-302	3RC20BF153K N16-R-50336-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF153K; 15,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-76	No. 2 Grid Resistor for V-301
R-303		Same as R-111	Grid Resistor for V-302
R-304		Same as R-112	Plate Resistor for V-301
R-305		Same as R-112	Plate Resistor for V-301
R-306		Same as R-109	Voltage Divider for E-302
R-307	3RC20BF471K N16-R-49769-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF471K; 470 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-58	Cathode Resistor for CR-301 and CR-302
R-308		Same as R-109	Voltage Divider Resistor for V-301
R-309		Same as R-121	Cathode Resistor for V-301 and V-302
R-310	3Z7310-143 N16-R-87351-8010	RESISTOR, VARIABLE, COMPOSITION: one section; 1000 ohms ±20%; ½ w; std A taper; three terminals, wire lead type; enclosed metal case; 0.790 in. dia by 0.340 in. deep; contact arm grounded to mounting bushing; no off position; mounted by bushing, no. 10-32 threads, ⅝ in. lg; includes integral knob with reference arrow; Allen Bradley Co. Type T-102B; RCA part/dwg C-737873-204	Cathode Resistor for V-301 and V-302
R-311		Same as R-112	Plate Resistor for V-302
R-312		Same as R-112	Plate Resistor for V-302
R-313		Same as R-110	Grid Resistor for V-301
R-314		Same as R-302	No. 2 Grid Resistor for V-302
R-315		Same as R-301	Isolation Resistor for V-302
R-316		Same as R-302	No. 2 Grid Resistor for V-303
R-317		Same as R-111	Grid Resistor for V-303
R-318		Same as R-112	Plate Resistor for V-303
R-319		Same as R-112	Plate Resistor for V-303
R-320		Same as R-109	Voltage Divider for V-304
R-321		Same as R-307	Cathode Resistor for CR-303 and CR-304
R-322		Same as R-109	Voltage Divider for V-303
R-323		Same as R-121	Cathode Resistor for V-303 and V-304
R-324		Same as R-310	Cathode Resistor for V-303 and V-304
R-325		Same as R-112	Plate Resistor for V-304
R-326		Same as R-112	Plate Resistor for V-304
R-327		Same as R-110	Grid Resistor for V-303
R-328		Same as R-302	Grid Resistor for V-304
R-329		Not Used	

R-330		Same as R-120 in equipments w/ serial no. 1 through 400; not used in equipments w/ serial no. above 400	
R-331 thru R-400		Not Used	
R-401	3Z6047-44 For replacement use N16-R-49768-566	RESISTOR, FIXED, FILM: 470 ohms ±1%; ½ w; 350 v max working; derates to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 19/32 in. lg by 1 1/64 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co. Type N-20; RCA part/dwg A-8817630-5	Filter Resistor for E-401
R-402	3RC20BF274K N16-R-50741-811	Same as R-813 in equipments w/ serial no. 1 through 400; in equipments w/ serial no. above 400 description is as follows: RESISTOR, FIXED, COMPOSITION: MIL type RC20BF274K; 270,000 ohms ±10%; ½ w; BF resistance and temp characteristic; body dim excluding terminals, 0.375 in. lg by 0.138 in. dia; insulated; resistant to humidity and salt waer immersion; two terminals, axial wire lead type, 1.500 in. lg by 0.028 in. dia; color coded; Mil Spec R-11-A; RCA part/dwg C-722318-91	Isolation Resistor for V-401B
R-403		Same as R-211	Voltage Divider Resistor for V-401B
R-404		Same as R-104	Grid Resistor for V-401B
R-405		Same as R-116	Plate Resistor for V-401A
R-406		Same as R-207	Cathode Resistor for CR-401 and CR-402
R-407		Same as R-116	Plate Resistor for V-401B
R-408		Same as R-207	Cathode Resistor for V-401
R-409		Same as R-211	Voltage Divider for V-401A
R-410		Same as R-104	Grid Resistor for V-401A
R-411		Same as R-813 in equipments w/ serial no. 1 through 400; same as R-402 in equipments w/ serial no. above 400	Isolation Resistor for V-401A
R-412		Same as R-402	Isolation Resistor for V-402A
R-413		Same as R-211	Voltage Divider for V-402B
R-414		Same as R-104	Grid Resistor for V-402B
R-415		Same as R-116	Plate Resistor for V-402A
R-416		Same as R-116	Cathode Resistor for CR-403
R-417		Same as R-207	Cathode Resistor for CR-404 and CR-405
R-418		Same as R-116	Plate Resistor for V-402B
R-419		Same as R-207	Cathode Resistor for V-402
R-420		Same as R-211	Voltage Divider for V-402A
R-421		Same as R-104	Grid Resistor for V-402A
R-422		Same as R-402	Isolation Resistor for V-402A
R-423		Same as R-402	Isolation Resistor for V-403B
R-424		Same as R-211	Voltage Divider for V-403B
R-425		Same as R-104	Grid Resistor for V-403B
R-426		Same as R-116	Plate Resistor for V-403A
R-427		Same as R-116	Cathode Resistor for CR-406
R-428		Same as R-207	Cathode Resistor for CR-407 and CR-408
R-429		Same as R-116	Plate Resistor for V-403B
R-430		Same as R-207	Cathode Resistor for V-403
R-431		Same as R-211	Voltage Divider for V-403A

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
R-432		Same as R-104	Grid Resistor for V-403A
R-433		Same as R-402	Isolation Resistor for V-403A
R-434		Same as R-402	Isolation Resistor for V-404B
R-435		Same as R-101	Coincidence Isolation Resistor for V-404
R-436		Same as R-211	Voltage Divider for V-404B
R-437		Same as R-104	Grid Resistor for V-404B
R-438		Same as R-116	Plate Resistor for V-404A
R-439		Same as R-207	Cathode Resistor for CR-409 and CR-410
R-440		Same as R-116	Plate Resistor for V-404B
R-441		Same as R-207	Cathode Resistor for V-404
R-442		Same as R-211	Voltage Divider for V-404A
R-443		Same as R-104	Grid Resistor for V-404A
R-444		Same as R-402	Isolation Resistor for V-404A
R-445	3Z7250-101 N16-R-87191-8010	RESISTOR, VARIABLE, COMPOSITION: one section; 500 ohms ±20%; ½ w; std A taper; three terminals, wire lead type; enclosed phenolic case; 0.790 in. dia by 0.340 in. deep; contact arm grounded to mounting bushing; no off position; mounted by bushing, no. 10-32 threads, ⅜ in. lg; includes integral knob with reference arrow; Allen Bradley Co. Type T501B; RCA part/dwg C-737873-203	Cathode Resistor for V-401, V-402, V-403 and V-404
R-446 thru R-500		Not Used	
R-501		Same as R-401	Filter Resistor for E-501
R-502		Same as R-402	Isolation Resistor for V-501B
R-503		Same as R-101	Coincidence Resistor for V-501B
R-504		Same as R-211	Voltage Divider for V-501B
R-505		Same as R-104	Grid Resistor for V-501B
R-506		Same as R-116	Plate Resistor for V-501A
R-507		Same as R-207	Cathode Resistor for CR-501 and CR-502
R-508		Same as R-116	Plate Resistor for V-501B
R-509		Same as R-207	Cathode Resistor for V-501
R-510		Same as R-211	Voltage Divider for V-501A
R-511		Same as R-104	Grid Resistor for V-501A
R-512		Same as R-402	Isolation Resistor for V-501A
R-513		Same as R-402	Isolation Resistor for V-502B
R-514		Same as R-211	Voltage Divider for V-502B
R-515		Same as R-104	Grid Resistor for V-502B
R-516		Same as R-116	Plate Resistor for V-502A
R-517		Not Used	

R-518		Same as R-207	Cathode Resistor for CR-504 and CR-505
R-519		Same as R-116	Plate Resistor for V-501B
R-520		Same as R-207	Cathode Resistor for V-502
R-521		Same as R-211	Voltage Divider for V-502A
R-522		Same as R-104	Grid Resistor for V-502A
R-523		Same as R-402	Isolation Resistor for V-502A
R-524		Same as R-402	Isolation Resistor for V-503B
R-525		Same as R-211	Voltage Divider for V-503B
R-526		Same as R-104	Grid Resistor for V-503B
R-527		Same as R-116	Plate Resistor for V-503A
R-528		Not Used	
R-529		Same as R-207	Cathode Resistor for CR-504 and CR-505
R-530		Same as R-106	Plate Resistor for V-503B
R-531		Same as R-207	Cathode Resistor for V-503
R-532		Same as R-211	Voltage Divider for V-503A
R-533		Same as R-104	Grid Resistor for V503A
R-534		Same as R-402	Isolation Resistor for V-503A
R-535		Same as R-402	Isolation Resistor for V-504B
R-536		Same as R-101	Coincidence Isolation Resistor for V-504
R-537		Same as R-211	Voltage Divider for V-504B
R-538		Same as R-104	Grid Resistor for V-504B
R-539		Same as R-116	Plate Resistor for V-504A
R-540		Same as R-207	Cathode Resistor for CR-509 and CR-510
R-541		Same as R-116	Plate Resistor for V-504B
R-542		Same as R-207	Cathode Resistor for V-504
R-543		Same as R-211	Voltage Divider for V-504A
R-544		Same as R-104	Grid Resistor for V-504A
R-545		Same as R-402	Isolation Resistor for V-504A
R-546		Same as R-445	Cathode Resistor for V-501, V-502, V-503, and V-504
R-547		Same as R-106 on equipments w/serial no. 1 through 1197 Not Used on equipments w/serial no. 1198 and above	Grid Feedback for V-502A
R-548		Same as R-106 on equipments w/serial no. 1 through 1197 Not Used on equipments w/serial no. 1198 and above	Grid Feedback for V-503A
R-549		Not Used on equipments w/serial no. 1 through 1197 Same as R-116 on equipments w/serial no. 1198 and above	Cathode Resistor for CR-503
R-550		Not Used on equipments w/serial no. 1 through 1197 Same as R-116 on equipments w/serial no. 1198 and above	Cathode Resistor for CR-506
R-551 thru R-600		Not Used	
R-601		Same as R-401	Filter Resistor for E-601
R-602		Same as R-402	Isolation Resistor for V-601B
R-603		Same as R-211	Voltage Divider for V-601B
R-604		Same as R-104	Grid Resistor for V-601B
R-605		Same as R-116	Plate Resistor for V-601A
R-606		Same as R-207	Cathode Resistor for CR-601 and CR-602

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS / STANDARD NAVY / AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
R-607		Same as R-116	Plate Resistor for V-601B
R-608		Same as R-207	Cathode Resistor for V-601
R-609	3Z6801-105 N16-R-73308-2801	RESISTOR, FIXED, FILM: 1 meg ±1%; ½ w; 350 max working; derated to "0" power at 150 deg C; resistance temp characteristic, −0.035% of total resistance per deg C average; 15/32 in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals; flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-234	Coincidence Isolation Resistor for V-601
R-610		Same as R-211	Voltage Divider for V-601A
R-611		Same as R-104	Grid Resistor for V-601A
R-612		Same as R-402	Isolation Resistor for V-601A
R-613		Same as R-402	Isolation Resistor for V-602B
R-614		Same as R-211	Voltage Divider Resistor for V-602B
R-615		Same as R-104	Grid Resistor for V-602B
R-616		Same as R-116	Plate Resistor for V-602A
R-617		Not Used	
R-618		Same as R-207	Cathode Resistor for CR-604 and CR-605
R-619		Same as R-116	Plate Resistor for V-602B
R-620		Same as R-207	Cathode Resistor for V-602
R-621		Same as R-211	Voltage Divider for V-602A
R-622		Same as R-104	Grid Resistor for V-602A
R-623		Same as R-402	Isolation Resistor for V-602A
R-624		Same as R-402	Isolation Resistor for V-603B
R-625		Same as R-211	Voltage Divider for V-603B
R-626		Same as R-104	Grid Resistor for V-603B
R-627		Same as R-116	Plate Resistor for V-603A
R-628		Not Used	
R-629		Same as R-207	Cathode Resistor for CR-607 and CR-608
R-630		Same as R-116	Plate Resistor for V-603B
R-631		Same as R-207	Cathode Resistor for V-603
R-632		Same as R-211	Voltage Divider for V-603A
R-633		Same as R-104	Grid Resistor for V-603A
R-634		Same as R-402	Isolation Resistor for V-603A
R-635		Same as R-402	Isolation Resistor for V-604B
R-636		Same as R-211	Voltage Divider for V-604B
R-637		Same as R-104	Grid Resistor for V-604B
R-638		Same as R-116	Plate Resistor for V-604A

R-639	Same as R-207		Cathode Resistor for CR-609 and CR-610
R-640	Same as R-116		Plate Resistor for V-604B
R-641	Same as R-207		Cathode Resistor for V-604
R-642	Same as R-609		Coincidence Isolation Resistor for V-604
R-643	Same as R-211		Voltage Divider for V-604A
R-644	Same as R-104		Grid Resistor for V-604A
R-645	Same as R-402		Isolation Resistor for V-604A
R-646	Same as R-445		Cathode Resistor for V-601, V-602, V-603, and V-604
R-647	Same as R-106		Grid Feedback for V-602A
R-648	Same as R-106		Grid Feedback for V-603A
R-649 thru R-700	Not Used		
R-701	Same as R-402		Isolation Resistor for V-701B
R-702	Same as R-211		Voltage Divider for V-701B
R-703	Same as R-104		Grid Resistor for V-701B
R-704	Same as R-116		Plate Resistor for V-701A
R-705	Same as R-207		Cathode Resistor for CR-701 and CR-702
R-706	Same as R-116		Plate Resistor for V-701B
R-707	Same as R-207		Cathode Resistor for V-701
R-708	3Z6056-37 N16-R-72961-4325	RESISTOR, FIXED, FILM: 560 ohms ±1%; ½ w; 350 v max working; derates to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 1⅝2 in. lg by 1⅛4 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co., Type N-20; RCA part/dwg A-8817630-6	Cathode Resistor for V-701 and V-702
R-709	Same as R-609		Coincidence Isolation Resistor for V-701
R-710	Same as R-211		Voltage Divider for V-701A
R-711	Same as R-104		Grid Resistor for V-701A
R-712	Same as R-402		Isolation Resistor for V-701A
R-713	Same as R-402		Isolation Resistor for V-702B
R-714	Same as R-211		Voltage Divider Resistor for V-702B
R-715	Same as R-104		Grid Resistor for V-702B
R-716	Same as R-116		Plate Resistor for V-702A
R-717	Same as R-207		Cathode Resistor for CR-703 and CR-704
R-718	Same as R-116		Plate Resistor for V-702B
R-719	Same as R-207		Cathode Resistor for V-702
R-720	Same as R-609		Coincidence Isolation Resistor for V-702
R-721	Same as R-211		Voltage Divider for V-702A
R-722	Same as R-104		Grid Resistor for V-702A
R-723	Same as R-402		Isolation Resistor for V-702A

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — STANDARD NAVY SIGNAL CORPS AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
R-724	3Z6668-39 N16-R-73166-8046	RESISTOR, FIXED, FILM: 68,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C average; $^{15}/_{32}$ in. lg by 0.130 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, axial wire lead type, 1¼ in. lg; color coded; Radell Type CD½PR; RCA part/dwg A-8835333-172	Grid Resistor for V-703A
R-725		Not Used	
R-726		Same as R-113	Plate Resistor for V-703A
R-727	3RC20BF222K N16-R-50012-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF222K; 2200 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-66	Cathode Resistor for V-703A
R-728		Same as R-302	Plate Resistor for V-703B
R-729	3RC20BF224K N16-R-50714-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF224K; 220,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-90	Grid Resistor for V-703B
R-730		Same as R-120	Grid Resistor for V-704 and V-705
R-731	3RC20BF333K N16-R-50417-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF333K; 33,000 ohms ±10%; ½ w; BF characteristic; 0.406 in. lg by 0.175 in. dia, excluding terminals; insulated; resistant to humidity and salt water immersion; two terminals, axial wire lead type, 0.028 in. dia by 1.5 in. lg; color coded; spec JAN-R-11; RCA part/dwg P-722318-80	Plate Resistor for V-704A
R-732		Same as R-731	Plate Resistor for V-704B
R-733		Same as R-731	Plate Resistor for V-705A
R-734		Same as R-731	Plate Resistor for V-705B
R-735		Same as R-109	Voltage Divider with R-736
R-736		Same as R-114	Cathode Resistor for V-704 and V-705
R-737		Same as R-118	Filter Resistor for E-701
R-738	3RC20BF105K N16-R-50975-811	RESISTOR, FIXED, COMPOSITION: JAN type RC20BF105K; 1 meg ±10%; ½ w; BF characteristic and temp characteristic; 0.375 in. lg by 0.138 in. dia excluding terminals; insulated; resistant to humidity and salt water immersion; two axial wire lead type terminals; 1.500 in. lg by 0.028 in. dia; color coded; spec MIL-R-11A; RCA part/dwg C-722318-98	C-708 Discharging Resistor
R-739 thru R-800		Not Used	
R-801		Same as 220	Grid Resistor for V-801
R-802		Same as R-116	Plate Resistor for V-801
R-803 thru R-807		Not Used	
R-808	3Z7450-198 N16-R-87850-7007	RESISTOR, VARIABLE, COMPOSITION: one section; 50,000 ohms ±20%; 0.2 w; std A taper; three terminals, solder lug type; enclosed metal case; ⅝ in. dia by $^{7}/_{16}$ in. lg; metal shaft; round, screwdriver slotted w/ 0.047 in. wide, 0.063 in. deep slot in end; ⅛ in. dia; $^{7}/_{16}$ in. lg from mounting surface; normal torque, w/ split bushing and shaft locking nut; contact arm insulated; no off position; mounted by bushing, ¼ in.-32 threads; ⅜ in. lg; non-turn device located on $^{15}/_{64}$ in. radius at 3 o'clock; Clarostat Mfg Co. Type no. 48W-9; RCA part/dwg C-737887-19	No. 3 Grid Resistor for V-802
R-809		Same as R-731	Plate Resistor for V-802

R-810	3Z7415-40 N16-R-87710-6990	RESISTOR, VARIABLE, COMPOSITION: one section; 15,000 ohms ±20%; 0.2 w; std A taper; three terminals, solder lug type; enclosed metal case, 5/8 in. dia by 7/16 in. lg; metal shaft; round, screwdriver slotted w/ 0.047 in. wide, 0.063 in. deep slot in end; 1/8 in. dia by 7/16 in. lg from mounting surface; normal torque, w/ split bushing and shaft locking nut; insulated contact arm; no off position; mounted by bushing, 1/4 in.-32 threads; 3/8 in. lg; non-turn device located on 15/64 in. radius at 3 o'clock; Clarostat Mfg Co. Type no. 48W-9; RCA part/dwg C-737887-18	Cathode Resistor for V-802
R-811		Same as R-113	Voltage Divider with R-810
R-812		Same as R-115	No. 3 Grid Resistor for V-803
R-813	3RC20BF334K N16-R-50759-811	RESISTOR, FIXED, COMPOSITION: MIL type RC20BF334K; 330,000 ohms ±10%; 1/2 w; BF resistance and temp characteristic; body dim., excluding terminals, 0.375 in. lg by 0.138 in. dia; insulated; resistant to humidity and salt water immersion; two axial wire lead type terminals; 1.500 in. lg by 0.138 in. dia; color coded; Mil Spec R-11-A; RCA part/dwg C-722318-92	Voltage Divider with R-815
R-814		Same as R-120	Plate Resistor for V-803
R-815	3Z6582-32 N16-R-73080-3719	RESISTOR, FIXED, FILM: 8200 ohms ±1%; 1/2 w; 350 v max working; derated to "0" power at 140 deg C; mineral film; resistance temp coefficient less than 0.02% of total resistance per deg C; 11/32 in. lg by 11/64 in. dia, excluding terminals; insulated; resistant to humidity; two terminals, axial wire lead type; marked with resistance and tolerance data; Corning Glass Co., Type N-20; RCA part/dwg A-8817630-12	Cathode Resistor for V-803
R-816	3Z7480-205 N16-R-88009-4158	RESISTOR, VARIABLE, COMPOSITION: one section; 100,000 ohms ±10%; 2 w; std "A" taper; three terminals, solder lug type; enclosed metal case, dim. excluding shaft 1 1/16 in. dia by 9/16 in. deep; metal shaft flatted, 9/32 in. lg by 1/4 in. dia by 5/8 in. lg; normal torque; insulated contact arm; no "off" position; bushing mounted, 3/8 in.-32 threads; 1/4 in. lg; non-turn device located on 17/32 in. radius at 9 o'clock; will withstand 100 hr 20% salt spray; will withstand 900 v rms 60 cycle between terminal and mounting bushing for 1 minute; operating temperature range −55 deg C to +85 deg C; marked w/ RCA part/dwg no.; Allen Bradley Co. Type J; RCA part/dwg C-737872-16	Comparator Input Control
R-817		Not Used	
R-818		Same as R-108	Grid Resistor for V-803
R-819 thru R-900		Not Used	
R-901		Same as R-120	Cathode Resistor for CR-901
R-902		Same as R-302	No. 2 Grid Resistor for V-901
R-903	3Z6618-83 N16-R-73109-9378	Same as R-111 in equipments w/ serial no. 1 through 400. In equipments w/ serial no. above 400 description is as follows: RESISTOR, FIXED, FILM: 18,000 ohms ±1%; 1/2 w; 350 v max working; derated to "0" power at 150 deg C; metal film type; temp resistance characteristic; −0.035% of total resistance per deg C; 15/32 in. lg by 0.155 in. dia excluding terminals; vitreous enamel coated; resistant to humidity; two terminals; axial wire lead type; color coded; Continental Carbon Co. Type NF1/2; RCA part/dwg A-8835333-151	Grid Resistor for V-901
R-904		Same as R-112	Plate Resistor for V-901
R-905		Same as R-112	Plate Resistor for V-901
R-906		Same as R-109	Voltage Divider for V-902
R-907		Same as R-114	Cathode Resistor for V-901 and V-902
R-908		Same as R-310	Cathode Resistor for V-901 and V-902
R-909		Same as R-109	Voltage Divider for V-901
R-910		Same as R-112	Plate Resistor for V-902
R-911		Same as R-112	Plate Resistor for V-902
R-912		Same as R-302	No. 2 Grid Resistor for V-902
R-913		Same as R-111 in equipments w/serial no. 1 through 400. Same as R-104 in equipments w/serial no. above 400	Grid Resistor for V-902
R-914		Same as R-220	Cathode Resistor for CR-902

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS / STANDARD NAVY / AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
R-915		Same as R-115	Voltage Divider for V-903A
R-916		Same as R-120	Grid Resistor for V-903A
R-917		Same as R-215	Plate Resistor for V-903B
R-918		Not Used	
R-919		Same as R-402	Grid Resistor for V-903B
R-920 thru R-922		Not Used	
R-923		Same as R-113	Cathode Resistor for CR-903
R-924		Same as R-104	Plate Resistor for V-905B
R-925		Same as R-211	Voltage Divider for V-905B
R-926		Same as R-104	Grid Resistor for V-905A
R-927	3Z6733-23 N16-R-73246-3252	RESISTOR, FIXED, FILM: 330,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, −0.035% of total resistance per deg C average; $15/32$ in. lg by 0.155 in. dia, excluding terminals; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; RCA part/dwg A-8835333-211	Isolation Resistor for I-901
R-928		Same as R-215	Cathode Resistor for V-905
R-929	3Z6647-63 N16-R-73147-2551	RESISTOR, FIXED, FILM: 47,000 ohms ±1%; ½ w; 350 v max working; derated to "0" power at 150 deg C; resistance temp characteristic, 0.060% of total resistance per deg C; body dim, excluding terminals $15/32$ in. lg by 0.130 in. dia; uninsulated; resistant to humidity; two terminals, flexible axial wire lead type, 1¼ in. lg; color coded; Continental Carbon Co. Type NF-½; Sig spec A-17-3140 w/ amendment no. 1; will withstand 200 hr 20% salt spray; will withstand 1000 v DC between terminals and mounting bushing for 1 minute; operating temperature range −50 deg C to +70 deg C; marked w/ RCA part/dwg no.; Allen Bradley Co. Type JL-5031; RCA part/dwg A-8835333-165	Terminating Resistor for V-905B
R-930		Same as R-104	Plate Resistor for V-905A
R-931		Same as R-211	Voltage Divider for V-905B
R-932		Same as R-104	Grid Resistor for V-905B
R-933		Same as R-113	Cathode Resistor for CR-904
R-934 thru R-1000		Not Used	
R-1001	3Z7450-87 N16-R-87849-4590	RESISTOR, VARIABLE, COMPOSITION: one section; 50,000 ohms ±10%; 2 w; std "A" taper; three terminals, solder lug type; enclosed metal case; $1\frac{1}{16}$ in. dia by $\frac{9}{16}$ in. deep, excluding shaft; round metal shaft, screwdriver slotted w/ 0.047 in. wide, 0.063 in. deep slot in end; ¼ in. dia by ⅝ in. lg; normal torque, w/ split bushing and shaft locking nut; contact arm insulated; no "off" position; mounting bushing, ⅜ in.-32 threads; non-turn device located on $17/32$ in. rad at 3 o'clock; will withstand 200 hr 20% salt spray; will withstand 1000 v DC between terminals and mounting bushing for 1 minute. operating temperature range −50 deg C to +70 deg C; marked w/ RCA part/dwg no; Allen Bradley Co. Type JL-5031; RCA part/dwg C-737843-3	DC Voltage Adjustment
R-1002		Not Used	
R-1003	3RW17132 N16-R-65585-2171	RESISTOR, FIXED, WIRE WOUND: JAN type RW21G630; inductive winding, 63 ohms ±5%; 22 w; 275 deg C max continuous operating temperature; 2 in. lg by $1\frac{3}{16}$ in. wide by $21/32$ in. thick, excluding terminals; vitreous enamel; resistant to humidity; two tab type terminals, $17/32$ in. lg by $11/64$ in. wide by 0.015 in. min thick; two stack mounting holes 0.196 in. dia set apart 2¾ in.; marked w/ type designation and mfr name or trademark; spec JAN-R-26A; RCA part/dwg P-722463-429	Blower Filter Resistor

S-101	3Z9825-82.62 N17-S-66529-4766	SWITCH, ROTARY: four sections; non "pile-up" type contacts; 4 pole 5 throw; 6 positions max available; 115 v AC; rated to break 1 amp, carry 5 amp; bronze arm, brass contacts; arm and contacts silver plated; molded melamine type housing; 2 1/16 in. lg by 1 in. dia excluding shaft, bushing, and terminals; mounting bushing 3/8 in.-32 threads, 17/64 in. lg; flatted shaft, 21/32 in. lg by 1/4 in. dia; solder lug type terminals; to withstand 100 hr salt spray; operates up to 10,000 ft altitude and transport in altitudes of 50,000 ft; to withstand fungi resistant test; impact and vibration tests to operate in ambient temp of −55 deg C to +85 deg C; non-shorting type contacts; Grayhill Catalog no. 12YY2064-4; RCA part/dwg C-746525-2	Manual Repetition Rate Control
S-102	3Z9849.135 N17-S-74139-4844	SWITCH, TOGGLE: JAN type ST22N; DPDT; 5 amp 125 v; phenolic body; 1 9/32 in. lg by 2 3/32 in. wide by 2 3/32 in. deep, excluding terminals, bushing, and handle; actuating handle, bat type; 1 1/16 in. lg, excluding bushing; locking action; six solder lug type terminals, located on back; single hole mounting bushing, 16/32 in.-32 threads, 15/32 in. lg from mounting surface; all parts visible from front panel are black nickel finish, includes two mounting nuts; spec JAN-S-23; RCA part/dwg M-426780-13	Manual Trigger Polarity Control
S-103	3Z9825-140.1 N17-S-65973-9697	SWITCH, ROTARY; three sections; non "pile-up" type contacts; 3 poles 9 throws; 10 positions, max available; 115 v AC; rated to break 1 amp, carry 5 amp; bronze arm, brass contacts; arm and contacts silver plated; molded melamine type housing; 1 21/32 in. ±1/16 in. lg by 1 in. dia, excluding shaft, bushing, and terminals; mounting bushing, 3/8 in.-32 threads, 17/64 in. lg; flatted shaft, 15/16 in. lg by 1/4 in. dia; solder lug type terminal; resistant to salt water spray; non-shorting type contacts, Grayhill Type 12YY2063-10; RCA part/dwg C-746524-1	Manual 10 Yard Control
S-104		Same as S-102	Manual Output Polarity Control
S-105 thru S-400		Not Used	
S-401	3Z9825-140.2 N17-S-66534-8324	SWITCH, ROTARY: four sections; non "pile-up" type contacts; 4 poles 9 throws; 10 positions, max available; 115 v AC; rated to break 1 amp, carry 5 amp; bronze arm, brass contacts; arm and contacts silver plated; molded melamine type housing; 2 1/16 in. ±1/16 in. lg by 1 in. dia, excluding shaft, bushing, and terminals; mounting bushing, 3/8 in.-32 threads, 17/64 in. lg; flatted shaft 15/16 in. lg by 1/4 in. dia; solder lug type terminal; resistant to salt water spray; non-shorting type contacts; Grayhill Type 12YY2062-4; RCA part/dwg C-746524-2	Manual 100 Yard Control
S-402 thru S-500		Not Used	
S-501		Same as S-401	Manual 1000 Yard Control
S-502 thru S-600		Not Used	
S-601		Same as S-401	Manual 10,000 Yard Control
S-602 thru S-700		Not Used	
S-701	3Z9825-140.3 N17-S-64502-8401	SWITCH, ROTARY: two sections; non "pile-up" type contacts; 2 poles 4 throws; 4 positions max available; 115 v AC; rated to break 1 amp, carry 5 amp; bronze arm, brass contacts; arm and contacts silver plated; molded melamine type housing; 1 1/4 in. ±1/16 in. lg by 1 in. dia, excluding shaft, bushing, and terminals; mounting bushing, 3/8 in.-32 threads, 17/64 in. lg; flatted shaft, 15/16 in. lg by 1/4 in. dia; solder lug type terminal, resistant to salt water spray; non-shorting type contacts; Grayhill Type 12YY2062-4; RCA part/dwg C-746522-1	Manual 100,000 Yard Control
S-702		Same as S-102	Manual Test Control
S-703 thru S-800		Not Used	
S-801	329863-12D N17-S-72018-7719	SWITCH, TOGGLE: JAN type ST12D; SPDT; 2 amp, 250 v; phenolic body; 1 9/32 in. lg by 2 3/32 in. wide by 2 3/32 in. deep, excluding terminals, bushing, and handle; actuating handle, bat type; 1 1/16 in. lg excluding lgth of bushing; locking action; six solder lug type terminals, located on back; single hole mounting bushing, 15/32 in.-32 threads, 16/32 in. lg from mounting surface; will accept luminous tip JAN Type STFO1 or STRO1; Spec JAN-8-23; RCA part/dwg M-426780-4	Manual Comparator Polarity Control
S-802 thru S-1000		Not Used	

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS (SIGNAL CORPS / STANDARD NAVY / AIR FORCE)	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
S-1001	3Z9825-140 N17-S-64610-8433	SWITCH ROTARY: two sections; non "pile-up" type contacts; 2 poles, 5 throws; 6 positions max available; 115 v AC; rated to break 1 amp, carry 5 amp; bronze arm, brass contacts; arm and contacts silver plated; molded melamine type housing; 1 in. dia by 1¼ in. lg, excluding shaft, bushing and terminals; mounting bushing, ⅜ in.-32 threads 17/64 in. lg; flatted shaft, 21/32 in. lg by ¼ in. dia; solder lug type terminals; to withstand 100 hr salt spray; operates up to 10,000 ft altitude and transport in altitudes of 50,000 ft; to withstand fungi resistant test impact and vibration tests; non-shorting type contacts; Grayhill Catalog 12YY2062-6; RCA part/dwg C-746525-1	Manual Power Control
S-1002	3Z9695-17.20 N17-S-69856-5601	SWITCH, THERMOSTATIC: SPST; nickel silver body; cover base, brass mounting strip, electro tinned overall; 15/16 in. lg by ¾ in. wide by 0.374 in. thick, excluding terminals; switch to close when temp rises to 40 deg C. 104 deg F; switch to open when temp drops to 28 deg C, 82.4 deg F; +5 deg –0 deg; 12 deg C +5 deg –0 deg C temp differential; 200 ma, 115 v AC; two terminations, flexible wire lead type, located on one end; two 0.147 in. dia mounting holes on 0.937 in. centers in integral mounting plate; operating temp ranges –55 deg C to +85 deg C; will operate from 0 to 95% relative humidity; will operate at altitudes up to 10,000 ft; Stevens Manufacturing Co., Inc. Catalog Form M-76 (for reference only); RCA part/dwg C-746590-1	Automatic Blower Control
T-101	2Z9627-218 N17-T-79567-7426	TRANSFORMER, PULSE: blocking oscillator type; 160 to 2400 cycle repetition rate 0.9 microsecond pulsewidth; 204 ohms at 2400 cycles impedance for all three windings, 2.6 ohms DC resistance for all three windings; 130 v DC 50 v peak AC, 10 ma average 100 ma peak for all three windings; 130 volts DC test to ground; hermetically sealed metal case; body excluding terminals 15/16 in. lg by 1 in. wide by 15/16 in. OD; impregnated and/or filled in accordance w/ Spec MIL-T-27 Grade 1, Class A; 6 solder lug terminals located on bottom; 2 mounting holes 0.120 in. dia by 1⅛ in. c to c in mtg plate 1 in. wide by 1⅜ in. lg; unit to be capable of operation from –54 deg C to +80 deg C; hermetically sealed; RCA part/dwg C-745467-1	Trigger Output Transformer
T-102		Same as T-101	Blocking Oscillator Transformer for V-104A
T-103		Same as T-101	Blocking Oscillator Transformer for V-104B
T-104 thru T-800		Not Used	
T-801		Same as T-101	Comparator Input Transformer
T-802 thru T-1000		Not Used	
T-1001	2Z9621-572 N17-T-73620-4656	TRANSFORMER, POWER, STEPDOWN AND STEPUP: metal case, hermetically sealed; input: 105/110/115/120/125 v AC, 50 to 1000 cycles, single phase; two output winding; no. 1 secondary 113 v, no. 2 secondary 6.3 v, no. 1 secondary 230 ma, 130 v DC, no. 2 secondary 10 amp; 1500 v test between ea winding and between ea winding and ground; asphalt filled and impregnated; 5 in. lg by 4 in. wide by 3½ in. high; ten solder lug type terminals, located on end; for no. 10-32 by ½ in. lg mounting studs on 3¼ in. by 2⅞ in. mounting centers; grounded electrostatic shield between primary and secondary; operating temperature range –54 deg C to +85 deg C; spec MIL-T-27, para. 3.17.1; RCA part/dwg C-745455-1	Power Transformer
TP-101	2Z5598-55 N17-C-73107-5188	CONNECTOR, RECEPTACLE: one round female contact; straight type; over-all dim 59/64 in. lg by 9/32 in. across flats of body, 11/32 in. across flats of mounting nut; 1000 v operating peak; cylindrical shape w/ hex face; brass, nickel plated; red molded thermoplastic insert; one mounting bushing, ¼ in.-20 thread by ¾ in. lg; resistant to salt water spray; inner contact bronze silver plated; Industrial Products Co. Catalog no. IPC(RED)-225; RCA part/dwg C-746282-1	Test Point for V-102A
TP-102		Same as TP-101	Test Point for V-102B
TP-103		Same as TP-101	Test Point for V-104A
TP-104 thru TP-200		Not Used	

TP-201	Same as TP-101	Test Point for V-201
TP-202	Same as TP-101	Test Point for V-202
TP-203	Same as TP-101	Test Point for V-203
TP-204 thru TP-300	Not Used	
TP-301	Same as TP-101	Test Point for V-302
TP-302	Same as TP-101	Test Point for V-304
TP-303 thru TP-400	Not Used	
TP-401	Same as TP-101	Test Point for V-401
TP-402	Same as TP-101	Test Point for V-402
TP-403	Same as TP-101	Test Point for V-403
TP-404	Same as TP-101	Test Point for V-404
TP-405 thru TP-500	Not Used	
TP-501	Same as TP-101	Test Point for V-501
TP-502	Same as TP-101	Test Point for V-502
TP-503	Same as TP-101	Test Point for V-503
TP-504	Same as TP-101	Test Point for V-504
TP-505 thru TP-600	Not Used	
TP-601	Same as TP-101	Test Point for V-601
TP-602	Same as TP-101	Test Point for V-602
TP-603	Same as TP-101	Test Point for V-603
TP-604	Same as TP-101	Test Point for V-604
TP-605 thru TP-700	Not Used	
TP-701	Same as TP-101	Test Point for V-701
TP-702	Same as TP-101	Test Point for V-702
TP-703	Same as TP-101	Test Point for V-703
TP-704 thru TP-800	Not Used	
TP-801	Same as TP-101	Test Point for Grid No. 3 of V-802
TP-802	Same as TP-101	Test Point for Cathode of V-802
TP-803	Same as TP-101	Test Point for V-803
TP-804 thru TP-900	Not Used	
TP-901	Same as TP-101	Test Point for V-902
TP-902	Same as TP-101	Test Point for V-905

CONTRACT NObsr-52327

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TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS — SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
V-101	2J6BF7W N16-T-56211-0067	ELECTRON TUBE: medium mu duotriode; glass envelope, T-3; eight pin type terminations, located on bottom; receiving tube; RMA Type 6BF7W	Trigger Multivibrator
V-102		Same as V-101	Trigger Amplifiers
V-103	2J5902 N16-T-75902-0000	ELECTRON TUBE: beam power pentode; glass envelope, T-3; eight wire type tremination, located on bottom; receiving tube; RMA Type 5902	Trigger Output Cathode Follower
V-104		Same as V-101	Blocking Oscillator
V-105 thru V-200		Not Used	
V-201	2J5784 N16-T-75784-0000	ELECTRON TUBE: high transconductance cathode type pentode; glass envelope, T-3; seven wire type terminations, located on bottom; receiving tube; Raytheon Mfg. Co. Type CK5784	Oscillator
V-202		Same as V-201	Oscillator Gate
V-203		Same as V-101	Gate Multivibrator
V-204 thru V-300		Not Used	
V-301	2J5840 N16-T-75840-0000	ELECTRON TUBE: sharp cutoff pentode; glass envelope, T-3; eight wire type terminations, located on bottom; receiving tube; RMA Type 5840	½ of 2 to 1 Counter
V-302		Same as V-301	½ of 2 to 1 Counter
V-303		Same as V-301	½ of 2 to 1 Counter
V-304		Same as V-301	½ of 2 to 1 Counter
V-305 thru V-400		Not Used	
V-401		Same as V-101	1st 100 Yard Binary Counter
V-402		Same as V-101	2nd 100 Yard Binary Counter
V-403		Same as V-101	3rd 100 Yard Binary Counter
V-404		Same as V-101	4th 100 Yard Binary Counter
V-405 thru V-500		Not Used	
V-501		Same as V-101	1st 1000 Yard Binary Counter
V-502		Same as V-101	2nd 1000 Yard Binary Counter
V-503		Same as V-101	3rd 1000 Yard Binary Counter
V-504		Same as V-101	4th 1000 Yard Binary Counter
V-505 thru V-600		Not Used	
V-601		Same as V-101	1st 10,000 Yard Binary Counter
V-602		Same as V-101	2nd 10,000 Yard Binary Counter
V-603		Same as V-101	3rd 10,000 Yard Binary Counter

V-604		Same as V-101	4th 10,000 Yard Binary Counter
V-605 thru V-700		Not Used	
V-701		Same as V-101	1st 100,000 Yard Binary Counter
V-702		Same as V-101	2nd 100,000 Yard Binary Counter
V-703		Same as V-101	Reset Multivibrator
V-704		Same as V-101	Reset Amplifier
V-705		Same as V-101	Reset Amplifier
V-706 thru V-800		Not Used	
V-801		Same as V-101	Coincidence Amplifier
V-802		Same as V-201	Coincidence Mixer and Clipper
V-803		Same as V-201	Comparator Mixer
V-804 thru V-900		Not Used	
V-901		Same as V-301	Dither Multivibrator
V-902		Same as V-301	Dither Multivibrator
V-903		Same as V-101	Dither Integrator
V-904		Not Used	
V-905		Same as V-101	Comparator Multivibrator
W-1001	3E4000.85 Assemble from component parts	CABLE ASSEMBLY, POWER, ELECTRICAL: Navy spec (15-C-1) DCOP-2; 2 conductors; stranded; no. 18 AWG; synthetic rubber insulated; material in sequence from insulated conductor out; loose binder; neoprene sheath; 300 v DC; 6 ft. 3½ in. lg by 0.330 in. OD overall; terminal fitting on first end; one connector, RCA part/dwg A-8824395-1; terminal fitting on second end; one connector, RCA part/dwg K-897777-2; 16 strands ea conductor, no. 30 AWG; oil resistant; RCA part/dwg B-463410-501	AC Power Supply Cable
W-1002	3E4001.144 Assemble from component parts	LINE, RADIO FREQUENCY TRANSMISSION: coaxial type; 93 ohms nominal impedance, 14.5 mmf capacitance per ft; 750 v rms max operating voltage; single inner conductor, no. 22 AWG, copperweld; outer conductor, 0.191 in. OD, copper wire braid; type "A" plastic dielectric thread and tube spacer; 0.146 in. dia by 6 ft. 2 in. lg overall; two connectors, one ea end, AN type UG-260/U; type I synthetic resin outer jacket 0.242 in dia; RCA part/dwg B-463411-501	Trigger Cable
W-1003		Same as W-1002	Output Cable
W-1004		Same as W-1002	Comparator Cable
X-1001	2Z8670.33 N16-S-63515-4151	SOCKET, ELECTRON TUBE: JAN type TS101P01; 8 contacts; beryllium, silver plated; medium size, octal; oval shape; dim, excluding terminals 1⅞ in. lg by 1⅜ in. wide by ⅝ in. high, excluding terminals; molded plastic body; spec JAN-S-28; RCA part/dwg A-99393-1	Socket for C-1001
X-1002	3Z3282-42.9 N17-F-74267-5401	FUSEHOLDER: extractor post type; 250 v 15 amp; cartridge fuse, 1¼ in. lg by ¼ in. dia overall; phenolic body; nickel plated brass contacts, cup type; 2½ in. lg by $1\frac{1}{16}$ in. across flats overall; two solder lug type terminals; one ½ in. dia mounting hole; includes removable knob; Littelfuse Incorporated, Catalog no. 342001; RCA part/dwg K-844027-2	Holder for F-1001
X-1003		Same as X-1002	Holder for F-1002
Y-201	2X209-6555.98 N16-C-97170-4599	CRYSTAL UNIT, QUARTZ: JAN type CR-18/U per spec SCL-3059-13; incl one crystal plate; 6555.98 kc nominal frequency of plate; ±0.0005% tolerance from −55 deg C to +90 deg C; RCA crystal holder, type no. HC-6/U (mod); rectangular metal body; two std plug-in pin terminals, 0.238 in. lg by 0.050 in. dia, located on bottom, spaced 0.486 in. C to C; 0.788 in. lg by 0.750 in. wide by 0.345 in. deep overall; −55 deg C to +90 deg C temp range; air gap not externally adjustable; hermetically sealed; crystal plate etched; RCA part/dwg B-46113-2	6.5598 MC Crystal for V-201

CONTRACT NObsr-52327

TABLE 6-4. TABLE OF REPLACEABLE PARTS—Continued
RANGE CALIBRATOR TS-573/UP

REF. SYMBOL	STOCK NUMBERS SIGNAL CORPS STANDARD NAVY AIR FORCE	NAME OF PART AND DESCRIPTION	LOCATING FUNCTION
Z-1001	3Z1892-28.5 N17-S-50962-6869	FILTER, LOW PASS: 300 mc; 2½ in. lg by 1¼ in. wide by 1⅛ in. high; rectangular, metal case; mounts by two 0.187 in. holes, 2⅛ in C to C; two terminals solder lug type; 130 v AC-DC, 50 to 100 cycles line frequency, 155 ma current; min insertion loss at 50 ohms measured in decibels: 14 kc to 150 kc, 40 db; 150 kc to 500 kc, 60 db; 500 kc to 20 mc, 60 db; 20 mc to 300 mc, 50 db; operate in ambient temp from −55 deg C to +85 deg C; relative humidity to 95%; hermetically sealed; min life 2000 hr; fungi resistant to withstand 100 hr salt spray, operates from sea level to 50,000 ft; RCA part/dwg C-746677-1	Filters RF Energy Generated by Blower B-1001
Z-1002		Same as Z-1001	Filters RF Energy Generated by Blower B-1001
Z-1003	3Z1892-75 N17-S-50962-6885	FILTER, LOW PASS: filter has 10 db attenuation at 20 kc, then becomes excessive to 110 mc where attenuation is reduced to 42 db; 3 1/16 in. lg by 1 in. wide by 1 in. high overall; rectangular, metal case; mounts by two 3/16 in. dia holes located on 2⅛ in. by ½ in. mounting centers; two solder tab type terminals; unit to be hermetically sealed; must withstand 100 hr salt spray test; to be marked with RCA part/dwg C-748029-1, 115 v AC, 1.5 amp, 50 to 1000 cycles; Filtron Co. Type no FA889-A; RCA part/dwg C-748029-1	RF Line Filter
Z-1004		Same as Z-1003	RF Line Filter
	1F425-62 N15-C-12202-25	CABLE, RF: JAN type RG-62/U; coaxial; characteristic impedance 93 ohms; 14.5 mmf per foot max; 750 v rms max working; inner cond single no. 22 AWG copper wire; braid woven from no. 36 AWG copper wire, max diam over braid 0.191 in.; polyethelene dielectric; rd shape, synthetic resin jacket; max OD 0.250 in.; 19 ft 5 in. lg; RCA part/dwg PS-744-62	

		CABLE, RF: coaxial; 300 v rms working; inner cond of PS-724-1; color, white w/ yellow and green tracer; shield woven from no. 36 AWG copper wire, primary insul over inner cond thermoplastic synthetic compound then extruded nylon jacket, rd; 0.062 in. max OD; flame-resistant; 7 ft lg; RCA part/dwg A-8820608-13	
		CABLE, RF: coaxial; 300 v rms working; inner cond of PS-724-1; color, white w/ green and red tracer; shield woven from no. 36 AWG copper wire, primary insul over inner cond thermoplastic synthetic compound then extruded nylon jacket, rd; 0.062 in. max OD; flame-resistant; 7 ft 3 in. lg; RCA part/dwg A-8820608-15	
		CABLE, RF: coaxial; 300 v rms working; inner cond of PS-724-1; color, white w/ blue and brown tracer shield woven from no. 36 AWG copper wire, primary insul over inner cond thermoplastic synthetic compound then extruded nylon jacket, rd; 0.062 in. max OD; flame-resistant; 6 ft 6 in. lg; RCA part/dwg A-8820608-19	

CONTRACT NObsr-52327

* Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 6-6. CROSS REFERENCE PARTS LIST
RANGE CALIBRATOR TS-573/UP

JAN TYPE NO.	KEY SYMBOL
CE53C400J	C-1001
CM25E102G	C-112
CM35E103G	C-102
CR-18/U	Y-201
CT1B150	C-906
CV11A250	C-202
RC20BF102K	R-201
RC20BF103K	R-132
RC20BF104K	R-120
RC20BF105K	R-738
RC20BF122K	R-220
RC20BF153K	R-302
RC20BF222K	R-727
RC20BF223K	R-113
RC20BF224K	R-729
RC20BF274K	R-402
RC20BF333K	R-731
RC20BF334K	R-813
RC20BF471K	R-307
RC20BF473K	R-115
RC20BF681K	R-118
RC20BF683K	R-301
RC20BF823K	R-133
RW21G630	R-1003
ST12D	S-801
ST22N	S-102
TS101P01	X-1001

NAVY TYPE	KEY SYMBOL
28032-3	F-1001
472407	L-111

ARMY-NAVY TYPE	KEY SYMBOL
UG-260/U	P-1003
UG-290/U	J-101

STANDARD NAVY STOCK NO.	KEY SYMBOL
F16-Q-304724-200	Major Unit
G17-F-16302-120	F-1001
G17-L-6806-130	E-905
G77-B-111-00403-1000	B-1001F
G77-B-111-00702-1000	B-1001E
N16-C-14435-1012	E-401
N16-C-14435-1013	E-501
N16-C-14435-1014	E-601
N16-C-14435-1015	E-701
N16-C-14435-1016	E-301
N16-C-14435-1019	E-801
N16-C-14435-1020	E-901
N16-C-14435-1025	E-403
N16-C-14435-1026	E-201
N16-C-14435-1028	E-101
N16-C-15627-7002	C-210
N16-C-15758-1002	C-302
N16-C-15919-9876	C-313
N16-C-15997-5451	C-411
N16-C-16061-6823	C-101
N16-C-16158-5395	C-505
N16-C-16254-5302	C-317
N16-C-16318-7901	C-213
N16-C-16543-7905	C-104
N16-C-16798-9875	C-107
N16-C-17086-7995	C-106
N16-C-17726-8115	C-114
N16-C-18659-7522	C-709
N16-C-18661-1280	C-109
N16-C-18918-8976	C-804
N16-C-19140-9675	C-108
N16-C-19250-4502	C-428
N16-C-22729-8740	C-1001
N16-C-28975-1524	C-807
N16-C-29265-2821	C-905
N16-C-31080-2527	C-112
N16-C-33612-3276	C-102
N16-C-45803-3215	C-201
N16-C-46200-9901	C-110
N16-C-48810-4001	C-1004
N16-C-61140-8100	C-906
N16-C-64036-4565	C-202
N16-C-73273-1553	L-101
N16-C-73488-2399	L-801
N16-C-73581-1570	L-301
N16-C-74035-4635	L-202
N16-C-74331-5344	L-111
N16-C-76645-4812	L-201
N16-C-97170-4599	Y-201
N16-R-28992-4106	L-1001
N16-R-49768-566	R-401
N16-R-49769-811	R-307
N16-R-49841-811	R-118
N16-R-49922-811	R-201
N16-R-49940-811	R-220
N16-R-50012-811	R-727
N16-R-50282-811	R-132
N16-R-50336-811	R-302
N16-R-50372-811	R-113
N16-R-50417-811	R-731
N16-R-50479-566	R-202
N16-R-50480-811	R-115
N16-R-50552-811	R-301
N16-R-50588-811	R-133
N16-R-50633-811	R-120
N16-R-50714-811	R-729
N16-R-50741-811	R-402
N16-R-50759-811	R-813
N16-R-50893-501	R-203
N16-R-50975-811	R-738
N16-R-65585-2171	R-1003
N16-R-72296-1258	R-206
N16-R-72882-1481	R-119
N16-R-72931-6458	R-127
N16-R-72961-4325	R-708
N16-R-72993-5954	R-121
N16-R-73020-8251	R-114
N16-R-73033-1751	R-215
N16-R-73043-2008	R-207
N16-R-73067-8981	R-112
N16-R-73073-7876	R-105
N16-R-73080-3719	R-815
N16-R-73092-6731	R-116
N16-R-73097-6564	R-111
N16-R-73105-1721	R-110
N16-R-73109-9378	R-903
N16-R-73114-2424	R-104
N16-R-73127-4427	R-106
N16-R-73137-3058	R-109
N16-R-73142-2951	R-103
N16-R-73147-2551	R-929
N16-R-73162-1351	R-102
N16-R-73166-8046	R-724
N16-R-73196-7338	R-108
N16-R-73196-9151	R-211
N16-R-73221-5551	R-101
N16-R-73246-3252	R-927
N16-R-73258-7041	R-209
N16-R-73308-2801	R-609
N16-R-87089-2901	R-129
N16-R-87191-8010	R-445
N16-R-87351-8010	R-310
N16-R-87710-6990	R-810
N16-R-87849-4590	R-1001
N16-R-87850-7007	R-808
N16-R-88009-4158	R-816
N16-S-63515-4151	X-1001
N16-T-55450-0070	CR-101
N16-T-56211-0067	V-101
N16-T-75784-0000	V-201
N16-T-75840-0000	V-301
N16-T-75902-0000	V-103
N17-B-78083-1517	E-202A
N17-B-78085-9760	E-1001
N17-B-78112-9720	E-803A
N17-B-78112-9721	E-103A
N17-B-78137-3814	E-102A
N17-B-78157-8916	E-302A
N17-B-86638-8688	B-1001B
N17-C-71126-5833	P-1001
N17-C-71408-3425	P-1003
N17-C-71431-5140	P-1002
N17-C-73107-5188	TP-101
N17-C-73108-1267	J-101
N17-C-73325-2481	P-101
N17-C-73446-3001	J-1001
N17-C-73619-5096	J-107
N17-C-804673-101	H-1056
N17-F-74267-5401	X-1002
N17-L-250177-226	I-1001A
N17-L-76652-1301	I-901B
N17-L-76737-2637	I-1001
N17-L-99999-11	I-901
N17-M-59416-7189	B-1001A
N17-R-51402-7246	CR-1001
N17-S-50962-6869	Z-1001
N17-S-50962-6885	Z-1003
N17-S-64502-8401	S-701
N17-S-64610-8433	S-1001
N17-S-65973-9697	S-103
N17-S-66529-4766	S-101
N17-S-66534-8324	S-401
N17-S-69856-5601	S-1002
N17-S-72018-7719	S-801
N17-S-74139-4844	S-102
N17-T-26653-4296	E-1024
N17-T-26683-4685	E-1025
N17-T-26711-9892	E-1020
N17-T-28236-4107	E-1021
N17-T-28255-8501	E-1003
N17-T-73620-4656	T-1001
N17-T-79567-7426	T-101
N42-F-1758-500	H-1044
N42-F-4363-1500	H-1058
N42-R-2052-550	O-1008
N43-W-7104-3040	O-1006

SIGNAL CORPS STOCK NO.	KEY SYMBOL
2J5784	V-201
2J5840	V-301
2J5902	V-103
2J6BF7W	V-101
2X209-6555.98	Y-201
2Z1607-132	B-1001D
2Z2462.822	H-1060
2Z2490.40	A-1001
2Z2642.1043	H-1041
2Z2642.1044	H-1040
2Z2642.1046	H-1048
2Z2712.88	H-1056
2Z3041-16	J-107
2Z3082-119	P-101
2Z3351-524	A-1006
2Z3723-428	N-1001
2Z3723-429	N-1003
2Z3723-430	N-1002
2Z4866.551	O-1005
2Z5598-55	TP-101
2Z5822-794	O-1003
2Z5822-795	O-1004
2Z5885-5	E-905
2Z5991-339	I-901
2Z5991-340	I-1001
2Z5991-370	I-901B
2Z6125-223	I-901A
2Z6125-224	I-1001A
2Z6820.721	A-1013
2Z7390-260	P-1003
2Z7390-290	J-101
2Z8670.33	X-1001
2Z9052-122	E-1022
2Z9052-123	E-1023
2Z9057-86	A-1005
2Z9621-572	T-1001
2Z9627-218	T-101
3C1084H-55	L-111
3C1084H-86	L-201
3C1084H-87	L-101
3C1084H-88	L-801
3C1084H-89	L-301
3C555-36	L-1001
3C555-37	L-202
3DA1-375	C-109
3DA1-419	C-709
3DA10-626	C-428
3DA10-627	C-108
3DA100-1169	C-201
3DA220-25	C-110
3DA2.700-12	C-804
3DB1-430	C-1004
3DB40-80	C-1001
3D9005-144	C-210
3D9007-47	C-302
3D9010-229	C-313
3D9015-170	C-411
3D9018-38	C-101
3D9022-66	C-505
3D9025V-82	C-202
3D9027-57	C-317
3D9033-53	C-213
3D9047-74	C-104
3D9068-41	C-107
3D9100-338	C-106
3D9143V	C-906
3D9150-116	C-807
3D9200-106	C-905
3D9220-43	C-114
3E4000.85	W-1001
3E4001.144	W-1002
3F2445-573-1	E-101
3F2445-573-2	E-102
3F2445-573-3	E-103
3F2445-573-4	E-104
3F2445-573-5	E-201
3F2445-573-6	E-202
3F2445-573-7	E-203
3F2445-573-8	E-204
3F2445-573-9	E-301
3F2445-573-10	E-302
3F2445-573-11	E-401

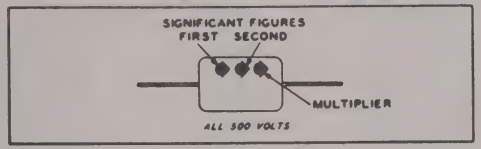
SIGNAL CORPS STOCK NO.	KEY SYMBOL	SIGNAL CORPS STOCK NO.	KEY SYMBOL	SIGNAL CORPS STOCK NO.	KEY SYMBOL	SIGNAL CORPS STOCK NO.	KEY SYMBOL
3F2445-573-12	E-402	3H388-101	B-1001C	3Z3585-16	CR-101	3Z7415-40	R-810
3F2445-573-13	E-403	3H450-20	B-1001B	3Z6007E5-67	R-119	3Z7450-87	R-1001
3F2445-573-14	E-501	3H4860-255	CR-1001	3Z6030-162	R-127	3Z7450-198	R-808
3F2445-573-15	E-601	3H5040-41	O-1008	3Z6047-44	R-401	3Z7480-205	R-815
3F2445-573-16	E-701	3H5041.3-40	O-1006	3Z6066-37	R-708	3Z770-11.42	E-202A
3F2445-573-17	E-704	3K2510253	C-112	3Z6100-352	R-121	3Z770-14.85	E-1001A
3F2445-573-18	E-705	3K3510353	C-102	3Z6120-69	R-206	3Z770-17.37	E-102A
3F2445-573-19	E-801	3RC20BF102K	R-201	3Z6270-49	R-114	3Z770-18.87	E-803A
3F2445-573-20	E-802	3RC20BF103K	R-132	3Z6390-27	R-215	3Z770-18.88	E-103A
3F2445-573-21	E-804	3RC20BF104K	R-130	3Z6458-51	R-207	3Z770-20.65	E-1040
3F2445-573-22	E-803	3RC20BF122K	R-220	3Z6575-122	R-112	3Z9695-17.20	S-1002
3F2445-573-23	E-901	3RC20BF153K	R-302	3Z6582-32	R-105	3Z9825-82.62	S-101
3F2445-573-24	E-902	3RC20BF222K	R-727	3Z6610-386	R-815	3Z9825-140	S-1001
3F2445-573-25	E-903	3RC20BF223K	R-113	3Z6612-83	R-116	3Z9825-140.1	S-103
3F2445-573-26	E-904	3RC20BF224K	R-729	3Z6615-175	R-111	3Z9825-140.2	S-401
3F30390-3	A-1008	3RC20BF274K	R-402	3Z6618-83	R-110	3Z9825-140.3	S-701
3F30390-3.1	A-1009	3RC20BF333K	R-731	3Z6622-68	R-903	3Z9849.135	S-102
3F30390-3.2	A-1010	3RC20BF334K	R-813	3Z6639-29	R-104	3Z9863-12D	S-801
3F30390-3.3	A-1002	3RC20BF471K	R-307	3Z6639-33	R-106	6F209-11	A-1019
3F30390-3.4	A-1003	3RC20BF473K	R-115	3Z6643-13	R-109	6L3804-20-7.2	H-1057
3F30390-3.5	H-1043	3RC20BF681K	R-118	3Z6647-51	R-103	6L3944-2051	A-1017
3F30390-3.6	A-1020	3RC20BF683K	R-301	3Z6647-63	R-202	6L6032-10.55F	H-1049
3F30390-3.9	A-1014	3RC20BF823K	R-133	3Z6682-22	R-929	6Z1735.6	P-1042
3F30390-3.10	A-1015	3RW17132	R-1003	3Z6682-29	R-102	6Z1737-58	P-1047
3F30390-3.11	A-1007	3Z1029-14.3	H-1061	3Z6682-39	R-724	6Z1933-1	O-1001
3F30390-3.12	A-1021	3Z10474	E-1003	3Z6712-39	R-211	6Z1933-92	O-1002
3F31480-2	H-1042	3Z12050-5.4	E-1020	3Z6722-36	R-108	6Z3150-4	P-1001
3F33175-2	A-1018	3Z12059-54	E-1024	3Z6733-13	R-101	6Z3660-21	A-1004
3F33390-3	A-1012	3Z12073-41.44	E-1021	3Z6738-11	R-927	6Z3810-16.18	H-1058
3F33390-3.1	A-1011	3Z12073-41.45	E-1025	3Z6768-32	R-209	6Z3810-16.19	H-1044
3F6000-1	N-1004	3Z1892-28.1	Z-1001	3Z6801-105	R-203	6Z4902-3	H-1046
3H1331-24	B-1001	3Z1892-75	Z-1003	3Z7225-33	R-609	6Z6012-20	H-1062
3H305-282	B-1001F	3Z2603.2	F-1001	3Z7250-101	R-129	6Z7465-43	O-1007
3H3100A02-26	B-1001A	3Z3282-42.9	X-1002	3Z7310-143	R-445	6Z8364-1	J-1001
					R-310		

CONTRACT NOber-62327

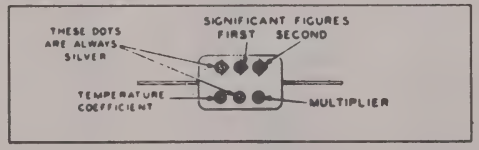
TABLE 6-7. APPLICABLE COLOR CODES AND MISCELLANEOUS DATA

CAPACITOR COLOR CODES

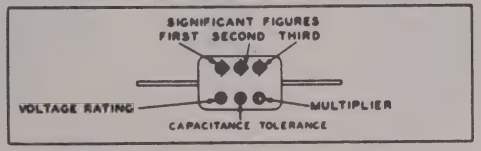
RMA 3-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



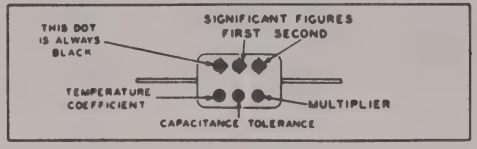
JAN 6-DOT COLOR CODE FOR PAPER-DIELECTRIC CAPACITORS



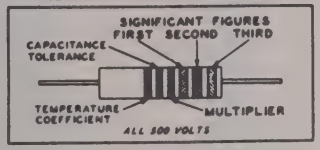
RMA 6-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



JAN 6-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS

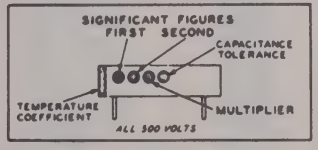


RMA COLOR CODE FOR TUBULAR CERAMIC-DIELECTRIC CAPACITORS

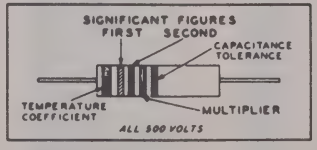


JAN COLOR CODE FOR FIXED CERAMIC-DIELECTRIC CAPACITORS

RADIAL TYPE NON-INSULATED



AXIAL TYPE INSULATED



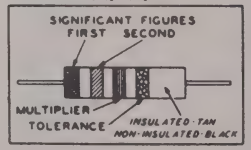
RMA: RADIO MANUFACTURERS ASSOCIATION
JAN: JOINT ARMY-NAVY

RESISTORS				CAPACITORS				
				MULTIPLIER				
TOLERANCE	MULTIPLIER	SIGNIFICANT FIGURE	COLOR	RMA MICA AND CERAMIC-DIELECTRIC	JAN MICA AND PAPER-DIELECTRIC	JAN CERAMIC DIELECTRIC	VOLTAGE RATING	TEMPERATURE COEFFICIENT
	1	0	BLACK	1	1	1		A
	10	1	BROWN	10	10	10	100	B
	100	2	RED	100	100	100	200	C
	1,000	3	ORANGE	1,000	1000	1000	300	D
	10,000	4	YELLOW	10,000			400	E
	100,000	5	GREEN	100,000			500	F
	1,000,000	6	BLUE	1,000,000			600	G
	10,000,000	7	VIOLET	10,000,000			700	
	100,000,000	8	GRAY	100,000,000		0.01	800	
	1,000,000,000	9	WHITE	1,000,000,000		0.1	900	
5	0.1		GOLD	0.1	0.1		1000	
10	0.01		SILVER	0.01	0.01		2000	
20			NO COLOR				500	

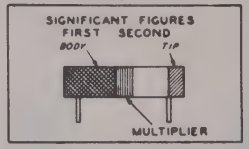
RESISTOR COLOR CODES

RMA COLOR CODE FOR FIXED COMPOSITION RESISTORS

AXIAL TYPE

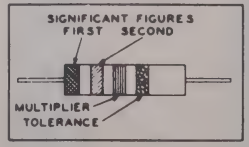


RADIAL TYPE



JAN COLOR CODE FOR FIXED COMPOSITION RESISTORS

AXIAL TYPE INSULATED



RADIAL TYPE NON-INSULATED

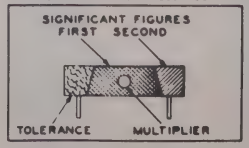


TABLE 6-8. LIST OF MANUFACTURERS

NAME	ADDRESS
Adel-Precision Products Co.	Burbank, Calif.
Allen-Bradley Co.	1326 So. 2nd Street, Milwaukee 4, Wis.
Camloc Fastener Co.	New York 17, N. Y.
Clarostat Mfg. Co., Inc.	1 Washington Street, Dover, N. H.
Continental Carbon Co.	295 Madison Avenue, New York, N. Y.
Dial Light Co. of America	900 Broadway, New York 3, N. Y.
General Electric Co.	Philadelphia, Pa.
G.E. Mazda Co.	Schenectady, N. Y.
Grayhill Co.	Madison Street, Chicago 24, Ill.
Harvey Hubbell, Inc.	State & Thomas Streets, Bridgeport 5, Conn.
Industrial Products Co.	Div. of Knudsen, Inc. Danbury, Conn.
Howard B. Jones Co.	2300 Wabansia Avenue, Chicago, Ill.
Littelfuse, Inc.	4757 N. Ravenswood Avenue, Chicago 40, Ill.
National Co., Inc.	Malden, Mass.
Patton-Mac Guyer Co.	Providence, R. I.
Prestole Corp.	Toledo, Ohio
Radio Corp. of America	Front & Cooper Streets, Camden, N. J.
Radio Receptor Co., Inc.	253 W. 19th Street, New York 11, N. Y.
Raytheon Mfg. Co.	Waltham, Mass.
Rotron Mfg. Co.	79 Schoonmaker Place, Woodstock, N. Y.
Shakeproof, Inc., Div. of Illinois Tool Works	2503 No. Keeler Avenue, Chicago 39, Ill.
Sprague Electric Co.	201 Beaver Street, No. Adams, Mass.
Stevens Mfg. Co., Inc.	63 So. Walnut, Mansfield, Ohio
Tinnerman Products, Inc.	8900 Brookpark Road, Cleveland 29, Ohio
Universal Electric Co.	300 E. Main Street, Owosso, Mich.
Western Rubber Co.	620 E. Douglas Street, Goshen 4, Ind.
Winchester Co.	6 E. 46th Street, New York 17, N. Y.
Winchester Electronics Co.	Glennbrook, Conn.

INDEX

SUBJECT	PAGE	FIGURE	TABLE
A			
Adjustments, See Initial Adjustments			
Alignment Procedure	5-5		
Coincidence Circuits	5-9		
Comparator Circuit	5-10		
Crystal Oscillator	5-5		
Decade Counters	5-9		
Dither Circuits	5-9		
High-Speed Counters	5-5		
Low-Speed Counters	5-9		
Trigger Circuits	5-5		
Amplifier, See Gated Amplifier			
B			
Basic Principles	1-1		
Bench Test	5-5		
Binary Counter Circuit	2-2	2-2	
Block Diagram, Functional		2-1	
Servicing		5-37	
Blocking Oscillator	2-10		
Blower Assembly	2-16		
Bottom View of Chassis, Sub-Assemblies in Place		5-2	
Sub-Assemblies Removed		5-3	
C			
Calibration With External Trigger	4-3		
With Internal Trigger	4-1		
Capabilities and Limitations	4-1		
Characteristics, Electrical	1-3		
Radar Set	4-1		
Chassis Top and Bottom Views, Sub-Assemblies in Place		5-2	
Sub-Assemblies Removed		5-3	
Coil Winding Data			5-3
Coincidence and Resetting	2-6		
Coincidence Circuits, Alignment Procedure	5-9		
Coincidence Outputs	2-13		
Color Code and Miscellaneous Data			6-7
Comparator Circuit	4-5		
Alignment Procedure	5-10		
Mixer Stage	2-15		
Multivibrator	2-15		
Controls, Front Panel			1-1
Counter Circuit, High-Speed	2-11		
Low Speed	2-13		
Counter Operation	2-5		
Decade		2-3	
Low-Speed		2-4	
High-Speed		2-9	

SUBJECT	PAGE	FIGURE	TABLE
Counter Resetting	2-13		
Counters, Binary	2-2		
Decade	2-5		
Counting Operation	2-12A		
Range	2-3		
Cross-reference Parts Lists			6-6
Crystal Oscillator	2-11		
Alignment Procedure	5-5		
D			
Data, Reference	1-2		
Winding			5-3
Decade Counters	2-5		
Alignment Procedure	5-9		
Operation		2-3	
Description of Unit	1-1		
Dither Circuit	2-15	2-6	
Alignment Procedure	5-9		
E			
Electrical Characteristics	1-3		
Electron Tube and Crystal Diode Complement			1-4
Emergency Maintenance	5-1		
Equipment, Lists	1-3		
Supplied			1-2
Error, Zero	5-10		
External Trigger	4-3		
F			
Failure Report		5-1	
Female Board Wiring Diagrams		5-14 to 5-22	
Front Panel Controls		4-1	1-1
Functional Block Diagram		2-1	
Fuse Replacement	5-1		
G			
Gate Multivibrator	2-11		
Gated Amplifier	2-11		
General Description	1-1		
H			
High-Speed Counter	2-11		
Alignment Procedure	5-5		
Operation		2-9	
I			
Initial Adjustments	3-1		
Installation	3-1		
Internal Trigger	4-1		

SUBJECT	PAGE	FIGURE	TABLE
L			
List of Major Units			6-3
Manufacturers			6-8
Equipment	1-3		
Locating Troubles	5-1		
Low-Speed Counter Circuit	2-13		
Alignment Procedure	5-9		
Operation		2-4	
Lubrication	5-1		
M			
Main Chassis Wiring Diagram		5-36	
Maintenance	5-1		
Emergency	5-1		
Routine	5-1		
Parts Kit			6-5
Major Units			6-3
Male Board Wiring Diagrams		5-23 to 5-35	
Manufacturers, List of			6-8
Maximum Range vs Trigger Repetition Frequency		4-2	
Mechanical Arrangement	2-3		
Mixer-Coincidence Circuits	2-7, 2-14	2-6	
Multivibrator—			
Comparator	2-15		
Gate	2-11		
O			
Operating Controls		4-1	
Operating Voltages and Currents			5-1
Operation	4-1		
Counters	2-5		
Counting	2-12		
Principles of	2-0		
Theory of	2-0		
Oscillator—			
Blocking	2-10		
Crystal	2-11		
Input	2-8		
Outline Diagram		3-1	
Outputs, Coincidence	2-13		
P			
Power Supply Circuit	2-16		
Principles of Operation	2-0		
Pulse Repetition Frequency	4-1		
Purpose and Basic Principles	1-1		
Purpose of Equipment	2-0		
R			
Radar Set Characteristics	4-1		
Range	4-1		

SUBJECT	PAGE	FIGURE	TABLE
Range Calibrator TS-573/UP	....	1-1	.....
Range Counting	2-3	.....	.....
Counting and Reset Diagram	....	2-7	.....
Reference Data	....	.....	.....
Replacement of Tubes and Fuses	5-1	.....	.....
Replacement Parts	....	.....	6-4
Reset Circuit	2-14	.....	.....
Resetting	2-13	.....	.....
Circuit	2-9	.....	.....
S			
Schematic Diagram	....	5-38	.....
Servicing Block Diagram	....	5-37	.....
Shipping Data	....	1-7	.....
Spare Parts Boxes—			
Shipping Weights and Dimensions	....	.....	6-2
Weights and Dimensions	....	.....	6-1
T			
Temperature Range	....	4-1	.....
Test Waveforms	....	5-4	.....
Testing, Bench	5-5	.....	.....
Theory of Operation	2-0	.....	.....
Top View of Chassis, Sub-Assemblies in Place	...	5-2	.....
Top View of Chassis, Sub-Assemblies Removed	...	5-3	.....
Trigger Circuits	2-9	2-7	.....
Alignment Procedure	5 5	.....	.....
Trouble Shooting	5-1	.....	.....
Tube—			
Characteristics	....	.....	5-2
Complement	....	.....	1-4
Operating Voltages and Currents	....	.....	5-1
Tubes, Replacement	5-1	.....	.....
U			
Unit Testing and Repair	5-11	.....	.....
Unpacking	3-1	.....	.....
V			
Voltage Measurement Charts	....	5-5 to 5-13	.....
W			
Waveforms	....	5-4	.....
Weights and Dimensions of Spare Parts Boxes	....	.....	6-1
Winding Data	....	.....	5-3
Wiring Diagram, Female Boards	....	5-14 to 5-36	.....
Main Chassis	....	5-36	.....
Male Boards	....	5-23 to 5-35	.....
Z			
Zero Error Determination	5-10	.....	.....

U. S. GOVERNMENT PRINTING OFFICE: 1956 O—394291

DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *20 July 1956*

TM 11–1228, Range Calibrator TS 573/UP is published for use of all concerned.

By Order of *Wilber M. Brucker*, Secretary of the Army:

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official:

JOHN A. KLEIN,
Major General, United States Army,
The Adjutant General.

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USAR: None.
For explanation of abbreviations used, see SR 320–50–1.